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Merchandizing Brings Large Savings

Ohio Brass Co. Achieves Economies by Installing Roller Conveyors, Sand Handling System and Other Labor-Saving Equipment

BY F. L. PRENTISS*

A SAVING of over 50 per cent has been effected in the brass casting department of the Ohio Brass Co., Mansfield, Ohio, by the installation of conveyors, a sand handling system and other labor-saving equipment, and the rearrangement of the foundry for more efficient operation. Manual handling has been largely eliminated. Thirty-four molders formerly made 100 molds a day. Now the same output is obtained with 15 molders. The amount of floor space occupied by the casting department has been sharply reduced.

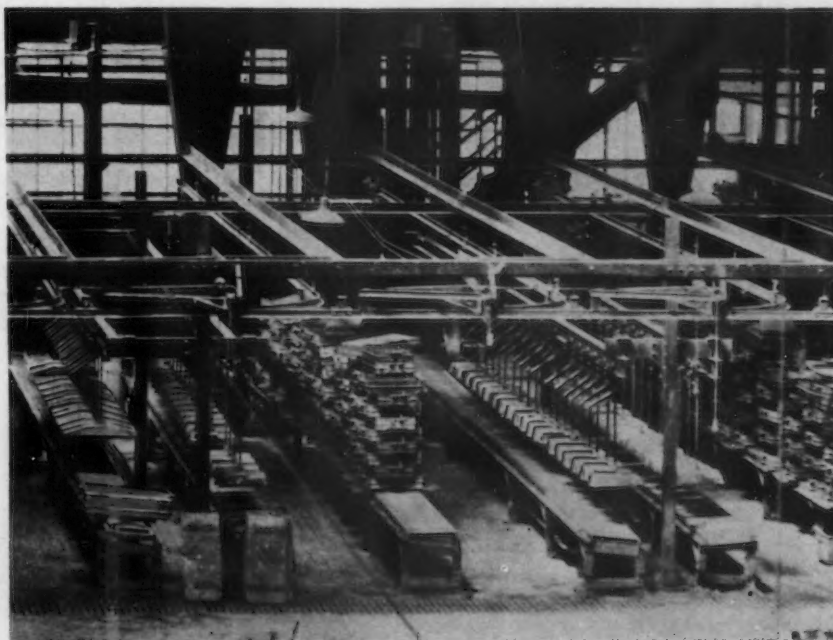
Rearrangement and the putting in of conveying equipment also resulted in a marked saving in labor in the cleaning and grinding department. Conveyors likewise increased efficiency in the cleaning and finishing departments of the company's malleable iron foundry.

Roller conveyors on which the molds in the brass foundry are handled and poured take the place of the customary molding floors. Fifteen molding machines, serving 15 floors, are located in a row across the rear of the foundry, and a roller conveyor, 30 ft. long, ex-

tends from directly back of each machine to the shake-out. The conveyors are at a convenient height for pouring and have rollers 15 in. long, which are set on a 5-deg. or 6-deg. angle, so that the pouring end of the mold or sprue is 1 in. higher than the opposite end, permitting the metal to flow downward in the mold. The shafts of the rollers fit into slotted holes in the conveyor frame, permitting quick removal of a roller in case it is fouled by hot metal spillage.

When the molder completes his mold he places it on the end of the conveyor directly behind him and shoves along the row of molds he has previously made. As the rollers have ball bearings, this does not require much muscular effort. Between each two rows of mold conveyors is a third roller conveyor for carrying the flasks back to the molding machine. One return conveyor serves two mold conveyors, one on each side.

The molds, before pouring, are weighed down with a 115-lb. weight that is handled by a lifting device designed by the company. This consists of a handle-operated mechanism from which is sus-



ROLLER-TYPE Mold Conveyors Are Used in the Brass Casting Department. Mold weight-lifting devices are suspended above the conveyors. The molding machines are in a row adjoining the rear ends of the conveyor lines and the shake-out grating extends along the front of the conveyors. The cleaning department is directly back of the casting department

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CLEANING Room of the Brass Casting Department, Showing the Arrangement of Conveyors and One of the Industrial Trucks That Runs Between the Roller Conveyor Lines. The design of the shop boxes is also shown. In the rear, at the left, are the sprue cutters and, at the right, the sand blast machines

pendent a rod and at whose lower end the weight is attached. The weight is raised or lowered about 6 in. by manipulating the handle of the lifting device, which is conveniently located above the mold conveyor. The device is attached to a four-wheeled trolley, which moves along an I-beam runway above the conveyor. As there is a separate lifting device for each mold it is never necessary to move the weight along the runway for more than 2 in. or 3 in. to spot it above the mold.

Weights have two semi-circular notches on one side and one on the opposite side to provide openings for pouring the mold. In case there are two pouring holes in the same mold the weight can be easily swung around, bringing the two-notch side above the pouring side of the mold.

Steel flasks of two standard sizes are used, one 9 x 26½ in. and the other 12¾ x 17¾ in. The cope and drag halves of each size are 4 in. deep. The flasks move on the conveyors on bottom boards that are perforated gray iron castings having three braces crosswise and two lengthwise.

FINISHING Department for Soft Iron Malleable Castings. Coming from the sand blast machines in the rear, the castings are delivered by the industrial car to any one of the finishing benches over a short section of a roller conveyor



Formerly each pouring crew consisted of three men, one of whom shifted the weights by hand. Now two men form a pouring crew and two crews, or four men, pour the molds from the 15 floors. As much as 45,000 lb. of brass has been melted in the foundry in a day.

All melting is done in electric furnaces with the exception of some metal for special work, which is melted in crucible furnaces. The electrical melting equipment consists of three Detroit arc-type furnaces and four Ajax-Wyatt induction furnaces, ranging from 250 to 1000 lb. capacity. The furnaces are tapped in a 125-lb. ladle and carried to the pouring conveyors on a hand-operated monorail. The ladle, on leaving the melting department, passes a pyrometer station where its temperature is taken. If the reading is too high, chills are added. The minimum pouring temperature is 2050 deg. Fahr.

Castings are shaken out on a grating which extends the length of the foundry floors at the end of the mold conveyors. A crew of three men shakes the molds and hauls the castings to the cleaning room.

Sand Recovery System

Passing through the grating, the sand falls on a belt which delivers it to a bucket elevator. The latter discharges the sand on a vibrating screen, which separates the bulky cores and any metal that may be in the sand. From the screen the sand is delivered to a 30-ton hopper. From the hopper it goes to a revivifier, being automatically sprinkled on the way. From the revivifier it is delivered to a horizontal conveyor belt, from which scrapers feed it to hoppers above the molding machines.

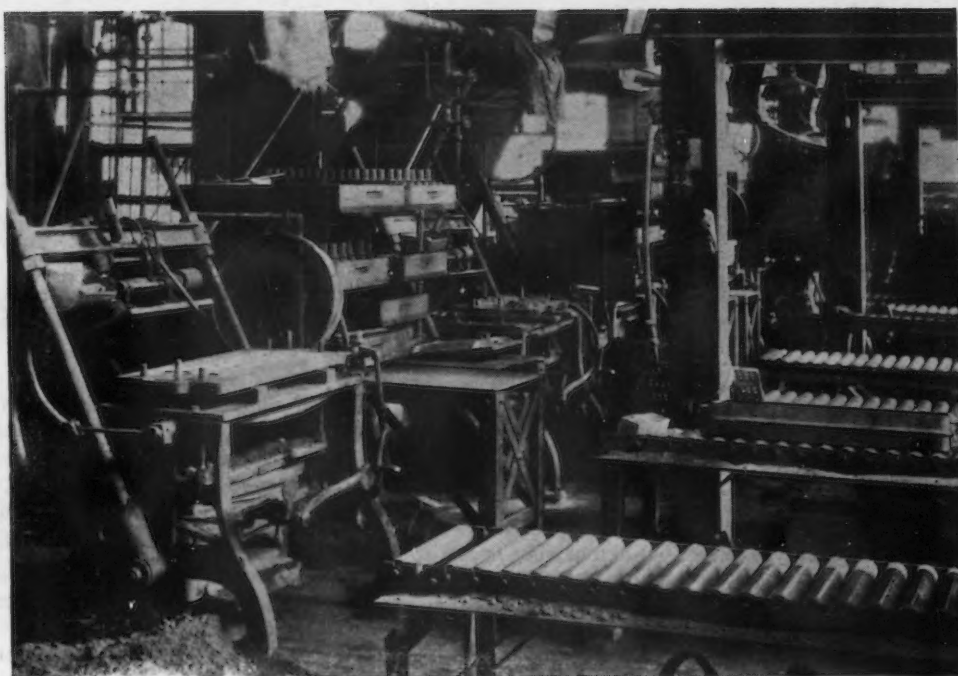
Unique Method of Conveying Castings

A rather unique, as well as efficient, method is provided for carrying the castings the short distance from the shakeout to the cleaning and grinding department, which

is located directly back of the casting department. Castings are loaded in steel shop boxes of a special design, with one end hopper-shaped for convenience in dumping. A hand truck, with steel wheels about 36 in. in diameter and resembling a two-wheeled cart, is pushed over the loaded shop box and this box, which has two eyes at one end and a hook at the other, is fastened to the truck by lowering one end of the truck and then the other. By moving the truck handles back to a horizontal plane, or the normal position for hauling, the box is raised about 6 in. above the floor and its weight is well balanced over the truck axle. The shop boxes are 30 in. wide, 36 in. long and 15 in. deep and have a capacity of 1000 lb. Similarly shaped but smaller boxes are used in the cleaning department. These boxes are 32 in. long, 20 in. wide and 10 in. deep and have a capacity of 300 lb.

Efficient Handling Equipment in Cleaning Department

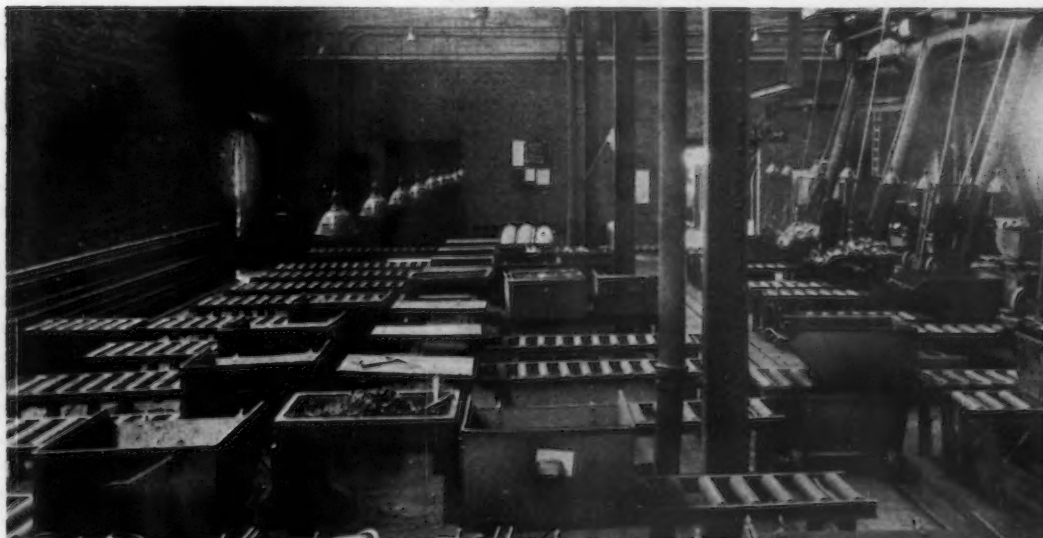
The material handling equipment provided in the cleaning and grinding department is efficient and one of its advantages is flexibility. This department is provided with numerous parallel lines of roller conveyors on each side of an industrial track, running at right angles down the center of the room. A transfer car with a roller table top runs on this industrial track. A similar track provided with another car extends alongside the row of conveyors nearest the brass foundry (at the left in the illustration). The roller tables on one side of the center track are 12 ft. long and on the other side 15 ft. long. With this arrangement of the handling equipment a box of work can be transferred from one roller table to any other roller table in the department. One convenience of the tables is that different alloys can be separated by being placed on separate lines. The table rollers in this department are 24 in. long.



CLOSE-UP of the Molding Machines and the Loading Ends of the Conveyor Lines. Slot holes in the frame for roller support are clearly shown. These slots for the roller shafts permit instant removal in case a roller is fouled by metal spillage

Boxes of castings, when deposited on the floor of the cleaning department by the two-wheeled truck, are picked up by a Cleveland 1000-lb. electric hoist and placed on the car on the first track and moved to sprue cutters, three of which are located at the lower end of the room. After the sprues are cut off, the castings are loaded into the smaller shop boxes and go to the industrial track extending down the center of the room. The sprues are carried on a monorail to the melting room. The castings, if rough ground, go to the grinding machines. If not rough ground, they pass across one of the conveyors to the outer side of the room and the boxes are picked up by an electric hoist, which dumps them into the sand blast. There are five sand blasts, four of the barrel type and one of the hand type. From the sand blast the castings go to the other end of the room for final trimming and inspection, after which they are placed in barrels or trays in which they go to the brass finishing department or stock room.

Castings requiring finish grinding go to grinding



IN the Soft and Hard Iron Grinding Department of the Malleable Foundry Also, Roller Conveyors and a Connecting Industrial Car Are Used for Handling Work

machines after inspection. This grinding is done on double-wheel machines, having 46-grain, oil-treated wheels, 16 in. in diameter with 2-in. face and 1½-in. shaft. Formerly 8 in. diameter by 1-in. face grinding wheels were used, but production has been materially increased by using the larger wheels. Snagging off gates and other rough grinding after sprue cutting is done on grinding machines with 16 x 3-in. x 1½-in. shaft, 16-grain grinding wheels. One of the cleaning room operations is vibrating valve body castings with an air hammer to loosen the hard core. A band saw instead of a sprue cutter is used for cutting off sprues in case the gating is too heavy or of a type that does not permit the work to be done readily with a sprue cutter.

With the new cleaning room arrangement a group wage system has been placed in effect for a large part of the operations. Work coming under the group, which usually consists of seven men, includes sprue cutting, band sawing, rough grinding, sand blast and core knockout.

Roller conveyors are used extensively in the company's malleable iron cleaning and finishing departments, where castings are moved in tote boxes similar to those used in the brass foundry. Castings, after leaving the malleable iron molding department, are given a preliminary sand blast. This cleans them sufficiently to allow individual inspection and the elimination of foundry losses. The imperfect castings are thrown out and the remainder go to the hard and soft iron grinding department, where the fins are chipped off and the castings are inspected and rough ground, after which they go to the annealing department. Castings that are hot dipped are heat treated after annealing in order to eliminate brittleness, which often results from hot dip galvanizing. Heat treating is

done in a rotary oil-fired furnace, in which the work is kept 30 to 45 min. at a temperature of 1250 deg. Fahr.

Conveyors Speed Up Soft Iron Finishing

The soft iron finishing department is equipped with two lines of short sections of roller conveyors each 6 ft. long, there being about 40 conveyor sections in each line. The workmen's benches are located at the ends of these rows of conveyors. Between the two sections of conveyors there is an industrial track on which a roller top car operates. Castings are trucked from the annealing department to sand blast machines at the end of the finishing department and are loaded into the sand blast with an electric hoist. From the sand blast the castings are dumped into shop boxes which the hoist places on the industrial car. This is shoved to any desired roller conveyor and the box is pushed from the car on to the conveyor, bringing the castings within convenient reach of the man at the adjoining bench. Equipment along the conveyor lines includes five grinding machines.

Workmen become unusually proficient in finishing certain types of castings on which they come to specialize and the man operating the industrial car knows what kind of casting each man specializes on and delivers the boxes of work accordingly. After filing, chiseling and any other required finishing operations the castings are thrown in barrels at the side of the benches and trucked away. Handling labor is largely reduced by the arrangement of this department. No castings are piled on the floor and shoveling of work is eliminated.

The roller conveyors in the brass and malleable foundries were installed by the Logan Co. The sand handling system in the brass foundry was erected by Link-Belt Co.

Aluminum Alloy Used for French Hydroplanes

AN aluminum alloy similar to the "modified" casting alloys known here as Alpax and in Germany as Silumin has recently been employed in France in the construction of hydroplanes. It contains about 13 per cent silicon; one to two per cent of sodium is added just before pouring. The castings or ingots have a fine-grained microstructure; they are malleable, and slightly lighter than pure aluminum. Test pieces are quoted with unusually high strength: 30,000 to 35,000 lb. per sq. in., with elongations ranging from 7 to 15 per cent. The metal is said to be easily welded, and above all has a high resistance to corrosion by sea water.

Microstructure of Medium Manganese Steels

AS a result of studies on medium manganese steels (published as Technical Paper 466, Bureau of Mines), B. M. Larsen notes that fine grained pearlite and sorbite areas are produced in steels containing 1 to 2 per cent manganese.

Eutectoid microstructure appears in steels with a wider range of carbon; for instance, with 3 per cent manganese, the steel is essentially pearlitic if the carbon is anything between 0.60 and 0.90 per cent. Strongly marked dendritic structures appear in mild steels containing medium manganese, which persist as a markedly banded structure in the rolled or forged bars, the ferrite streaks in the latter always corresponding to the dendrite axes.

These patterns are not affected by ordinary heat treatment up to 1100 deg. C., but during an hour of heating

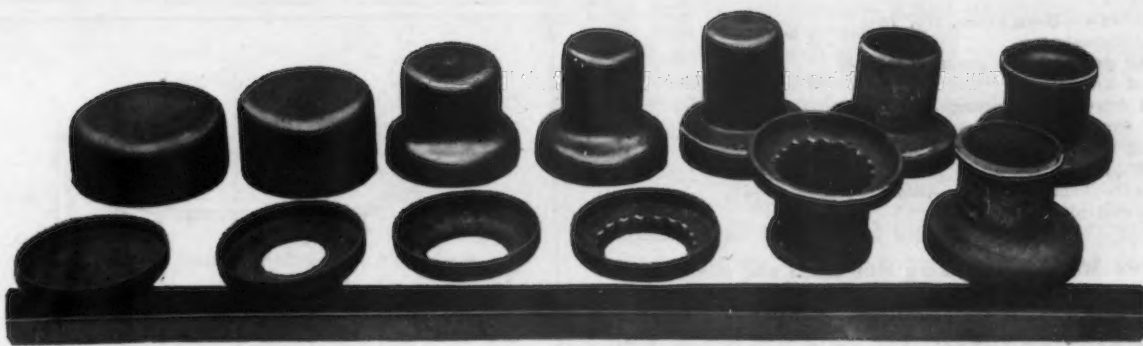
at 1300 deg. C. the manganese atoms appear to gain enough freedom of movement through the gamma iron space lattice to become much more uniformly distributed. This in turn suppresses the structure of banded ferrite and pearlite areas.

Smelting Lean Ore for Manganese

EXPERIMENTATION with a 6-ton blast furnace and ½-ton basic open-hearth furnace at the University of Minnesota, Minneapolis, has indicated to the Bureau of Mines that the manganese can be successfully recovered from the manganeseiferous iron ore existing in large deposits in the Lake region.

The problem is essentially one of separating the iron, phosphorus and manganese in ores which contain from 8 to 10 per cent manganese, about 45 per cent iron, and 0.2 to 0.3 per cent phosphorus. This separation is made by smelting the ore to a high-phosphorus spiegel in a blast furnace and then treating this product in a basic open-hearth. Reactions in the latter depend upon the principle that ferrous oxide and phosphorus compounds are reduced much more readily than manganous oxide.

A reducing atmosphere is provided in the open-hearth furnace by adding coke breeze to the slag bath after the manganese and part of the phosphorus have entered the slag as a result of iron ore additions. Average results of 193 open-hearth heats show that 86 per cent of the manganese in the spiegel was recovered in the slag and 10 per cent in the metal, leaving 4 per cent unaccounted for. The high-manganese slag (50 to 70 per cent MnO) can then be used for making ferromanganese in the blast furnace or electric furnace in the usual way.



Hubs Made in Fewer Operations

Drawing and Machining of Shells and Rings for Wheel
Centers Simplified—Counter-Flow Gas Furnace
Used for Annealing

BY W. M. HEPBURN*

SIMPLIFICATION of operations has brought down the cost and broadened the use of wire wheels for automobiles. The Houk Mfg. Co., and the Wire Wheel Corporation of America, Buffalo, were pioneers in wire wheels, and the former was absorbed by the latter. The Wire Wheel Corporation of America, now a division of the Kelsey-Hayes Wheel Corporation of Detroit, has a capacity of more than 40,000 wheels a month and is divided into the following manufacturing departments: Inner hub machining, hub shell machining, hub cap machining, rim punching, wheel assembly, enameling, plating, pressed steel, foundry.

New methods to reduce the number of manufacturing operations are being continually devised at this plant, and the hub shell for the Cadillac car is a good example. The shell formerly used on this car required 18 different operations and processes, including four anneals, while for the present shell there are only 12, including three anneals. Similarly the operations on the insert, which is an integral part of the shell, have been reduced from 11 to four.

In the old method of manufacture, the ring was

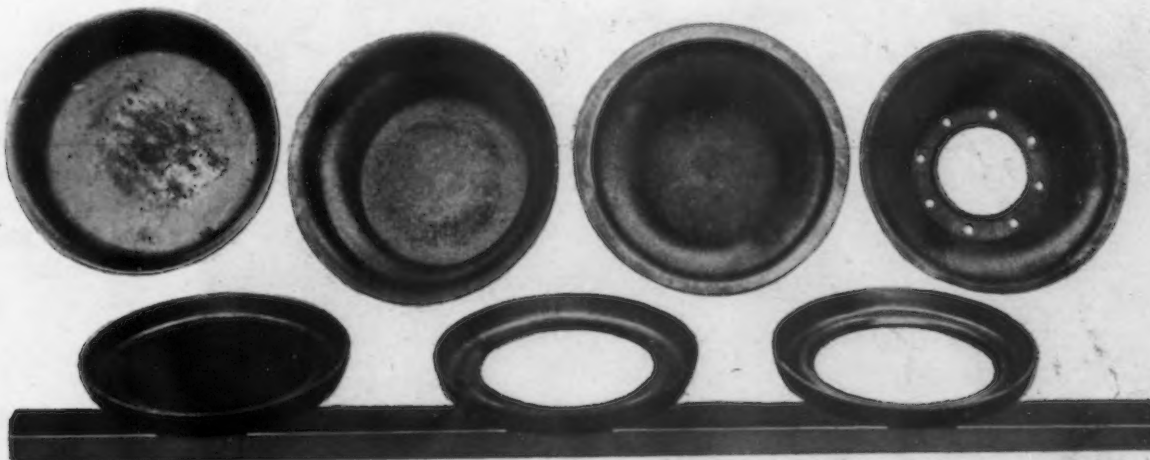
*Vice-president, Surface Combustion Co.

pressed into the shell, but in the new the two are welded together. They are pressed out of 3/16-in. steel plate. The operations and machines used in making the shell under the old method were as follows:

1. Blank cold in No. 76½ Bliss press
2. First draw—Bliss press, No. 16B
3. First anneal
4. Second draw—Bliss press, No. 15A
5. Second anneal
6. Third draw—Bliss press No. 310
7. Third anneal
8. Fourth draw—Bliss press, No. 79½
9. Fourth anneal
10. First form—Bliss press, No. 79½
11. Punch out small end—Bliss press, No. 74½
12. Trim large end to length—ordinary lathe
13. Trim small end to length—ordinary lathe
14. Spread neck of small end—Bliss press, No. 77½B
15. First curl (small end)—Bliss press, No. 77½B
16. Press ring into large end of shell—arbor press
17. Size and second curl (large end), locking ring in place—Bliss press, No. 78½B
18. Pickle and wash.

The hub shell then goes to the machining department. Operations on the ring were as follows:

1. Blank form—Bliss press, No. 76½B



Draws Required to Produce the Old Type of Hub Shell and Ring (at Top of Page). Draws on the new type (below)

2. First draw—Bliss press, No. 76½
3. First anneal
4. Second draw—Bliss press, No. 76½
5. Second anneal
6. Third draw—Bliss press, No. 78½
7. First form—Bliss press, No. 78½
8. Second form—Bliss press, No. 79½
9. Punch out center—Bliss press, No. 76½
10. Perforate location holes—Bliss press, No. 76½
11. Wash and pickle.

New Method of Making Hub Shell and Ring

Under the new method, with a redesigned shell, the work is reduced materially. The operations on this shell are:

1. Blank cold—Bliss press, No. 76½
2. First draw—Bliss toggle press 16B
3. First anneal
4. Second draw—Bliss toggle press, No. 15A or No. 16B
5. Second anneal
6. Third draw—Bliss press, Nos. 78½, 79½ or Nos. 310, 312 (hole-punched in No. 74½)
7. Third anneal
8. Form—Bliss press, No. 79½ or No. 312
9. Punch eight drive lug holes and center hole—Bliss press No. 76½
10. Trim flange on large end for ring—Bliss press, No. 76½
11. Spread neck of small end—Bliss press, No. 76½ or No. 78½
12. Wash and pickle

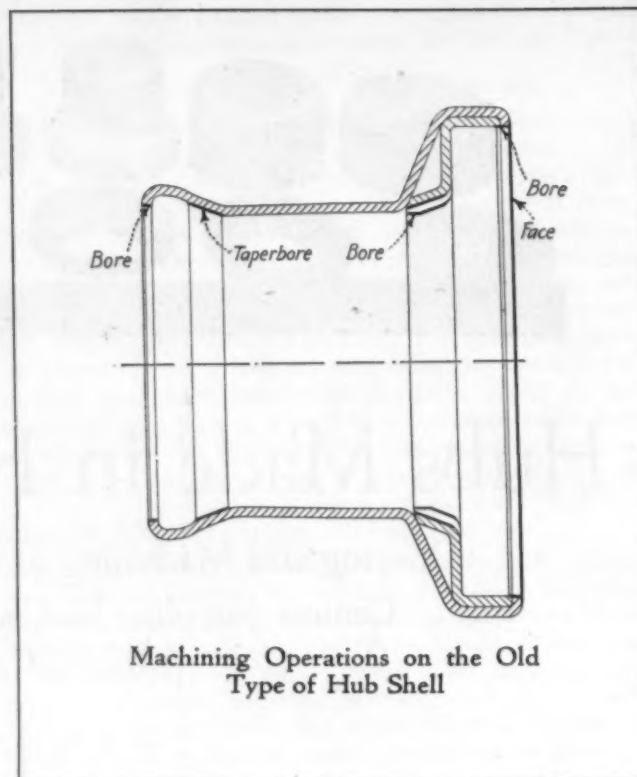
The operations on the ring for this job follow:

1. Blank cold—Bliss press, No. 76½
2. First draw—Bliss press, No. 79½
3. Punch out center—Bliss press, No. 79½ or No. 312
4. Form—Bliss press, No. 79½ or No. 312.

Old Method of Machining

These parts are loaded into tote boxes and removed to the machine department with lift trucks. The machining operations on the hub shell made by the old method are as follows:

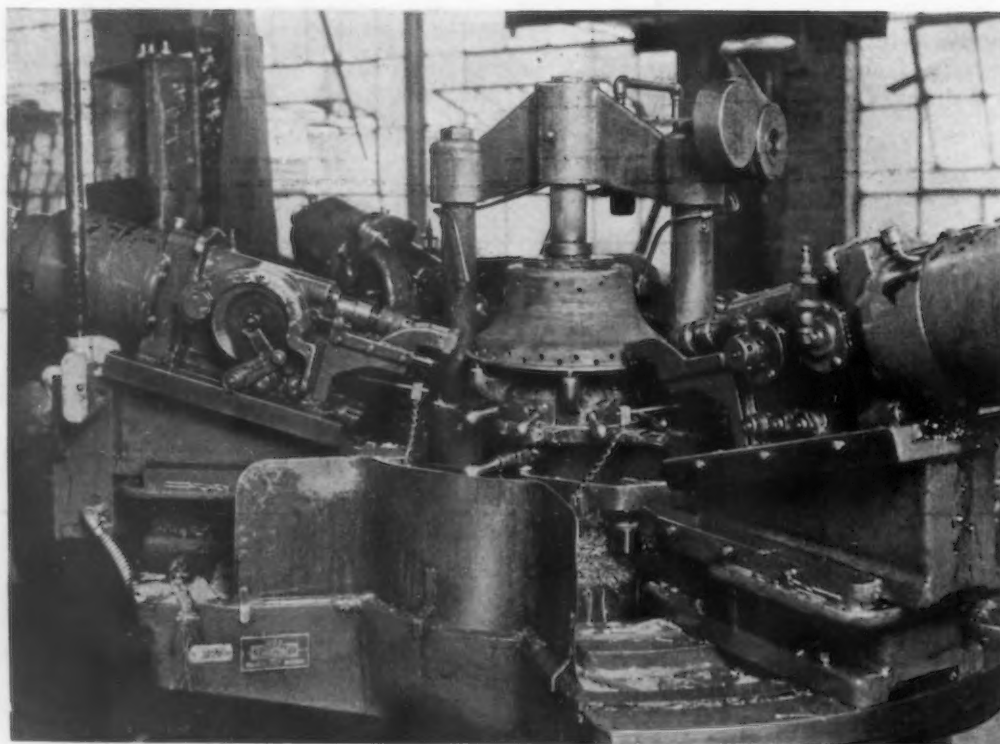
1. Rough-bore small end—engine lathe
2. Bore safety flange and chamfer—Jones & Lamson lathe
3. Finish bore small end—Jones & Lamson lathe
4. Drill 78 spoke holes complete in one operation—Kingsbury multiple-spindle drilling machine, with six operating spindles



Machining Operations on the Old Type of Hub Shell

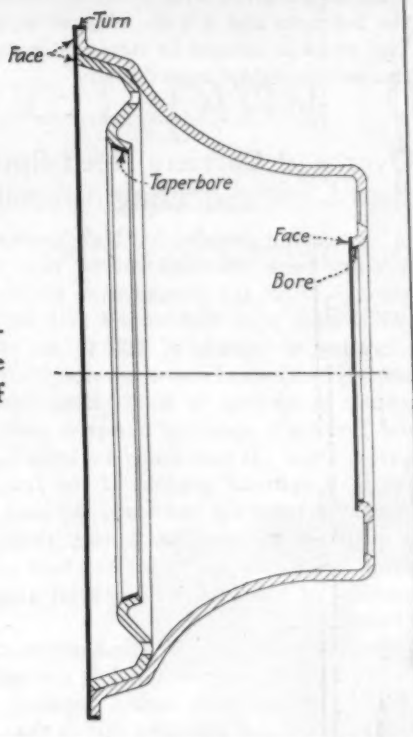
5. Countersink 52 holes in large end outside—Avey single-spindle drill press
6. Countersink 52 holes, large end inside—Avey single-spindle drill
7. Countersink 26 holes in small end inside—Avey single-spindle drill
8. Remove burrs wherever necessary—ordinary lathe
9. Rough polish (nickel plate department)
10. Finish polish (nickel plate department)
11. Press in locating pins.

The machine used on operation No. 4 consists of a horizontal table with six individually motor-driven drilling spindles mounted thereon. The shell is held in a quick-acting indexing fixture and six spoke holes are drilled at



Kingsbury Multiple-Spindle Machine Drilling Holes in New Hub Shell

Machining Operations on the New Type of Hub Shell



one time. Previously they were drilled on an Avey double-spindle press, one hole at a time, and the method just described cut the cost by 80 per cent.

Present Machine Operations

The machine operations on the new type of hub shell follow:

1. Weld ring to shell
2. Face, turn, bore and chamfer both ends—special Potter & Johnston turret lathe
3. Drill eight drive lug holes—Kingsbury multiple-spindle drill
4. Counterbore eight drive lug holes—Kingsbury multiple-spindle drill

5. Drill 54 holes complete—Kingsbury multiple-spindle drill
6. Burr large end of holes outside
7. Burr small end of holes inside
8. Countersink 36 holes in large end
9. Countersink 18 holes in smaller end
10. Polish.

The collection of operations under No. 2 in the above list are performed on a Potter & Johnston lathe with a special head and special tools, including two boring bars for boring and facing the center hole in the small end, a slide block carrying a 20-deg. tapering tool which bores the tapered inside ring, a guide to keep the tapering tool in alignment and a pilot bushing to guide the boring bars. The hub shell is held in specially designed chuck jaws and is machined in three positions of the turret, so that it contacts the three sets of tools one after the other.

In the first position the outside diameter is rough-turned, the center hole is rough-bored, the outer flange is rough-faced and the center hole is spot-faced for depth. In the second position all these surfaces are finished and in the third position the 20-deg. taper in the ring is roughed and finished. These nine operations are performed automatically in one machine and the time period is only 3.3 min.

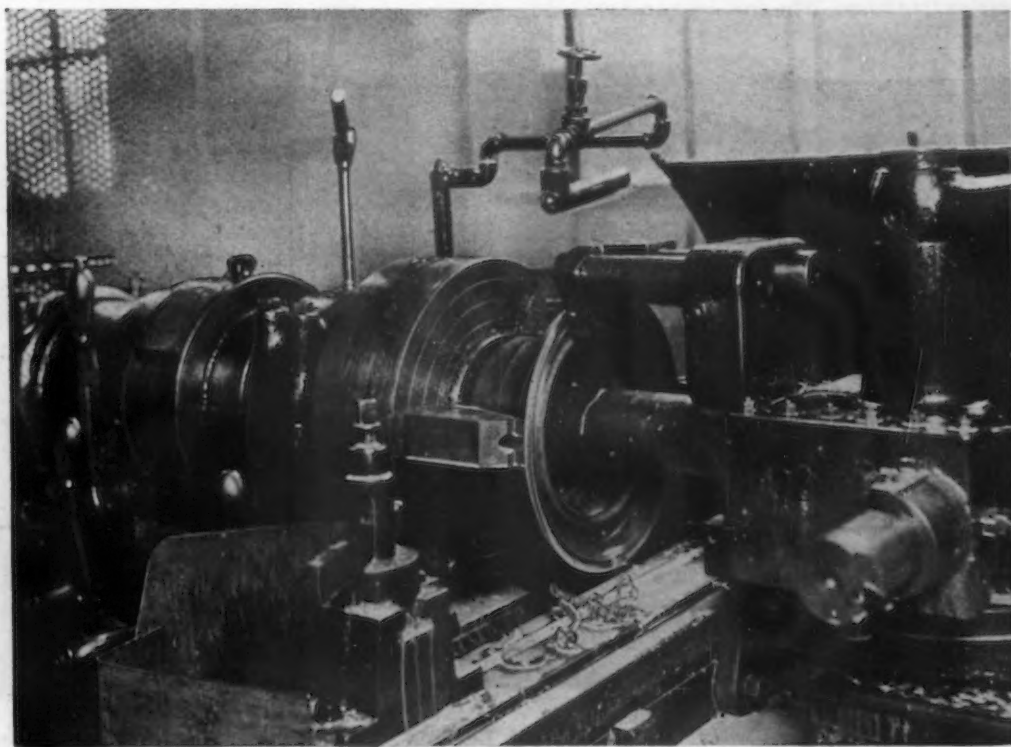
Counter-Flow Annealing Furnace

The present press operations include some severe draws and the annealing between these must be done with care. The furnace used is automatic and continuous both as to operation and temperature control, and was designed and built by the Surface Combustion Co., Toledo, Ohio.

In length it is 43½ ft., while the width and height are 8½ and 3 ft., respectively. The work is pushed through with a mechanical pusher, motor operated through a speed reduction gear train. The motor and pusher operate intermittently, with a time clock control by which the period the work remains in the furnace is regulated.

The furnace is of the counter-flow type, being divided into two parallel longitudinal sections, separate lines of

Set-up of Potter & Johnston Turret Lathe for Facing, Turning and Boring New Shell



work passing continually through both sections, but in opposite directions. The hot zone is in the center and the heat passes toward both ends into the other two zones, or heat interchangers, heat given off by the hot outgoing work being absorbed by the cold work entering.

The hot zone is 20 ft. long and the heat interchange zones are 11½ ft. in length each. Six rails are laid on the hearth, and these are of alloy steel in the hot zone but of cast iron in the other two parts. They project 4 ft. beyond each end of the furnace, and these extensions form loading and unloading platforms. The hearth is supported by piers.

Furnace Has Time Clock Control

The operation of the furnace is as follows: Trays are placed on each platform in front of the pushers and are loaded with work. At the proper time interval a clock opens a relay, which in turn starts lifting the motor operated doors. On reaching the raised position the doors make contacts and these start the pushers on the forward stroke. This, on completion, makes contact with a limit switch, which reverses the stroke action causing the pushing face to return to the starting position. The doors are then automatically closed.

The loaded tray under the door at the discharge end is removed manually before the door closes; it is then unloaded, pushed over in front of the pusher on the adjoining charging platform, loaded and left for the cycle described.

Heat is supplied in the hot zone through 32 gas burners, 16 on each side; these are staggered so that they fire both below the hearth and above the work, in the latter case tangentially to the arch of the roof. This serves to afford free and complete circulation of the hot gases, so vital to uniform heating. The burners are manifolded to inspirators, in groups of one, two and three, and are arranged so that when the furnace has been brought up to temperature, in the shortest time possible, part of them can be turned out, and only enough left burning to maintain this temperature.

The proper temperature gradient (1400 deg. Fahr. in the hot zone) is maintained automatically by three recording controllers, connected with motor operated valves on the gas supply lines. The furnace construction is of brick,

9 in. of firebrick with 9 in. of insulation being used in the hot zone and 4½ in. of each in the other two zones. The whole is incased in steel plates supported with double channel buckstay construction.

Overhead Carriers Need Spring Suspension and Long Wheelbase

Increasing demand for high speeds and carriers which will negotiate overhead curved rails of short radius has brought about the introduction of spring suspension and swivel ends with two wheels only in each end. Carriers operating at speeds of 600 f.p.m. or greater could not possibly withstand hard service unless the weight were sprung, according to E. T. Bennington, Cleveland Electric Tramrail, speaking before a meeting of engineers in Akron, Ohio. It can easily be imagined what would happen to a railroad roadbed if the freight cars were built without springs for the load; the cars and roadbed would be pounded to pieces in a very short while. The same thing would happen to an overhead-conveyor system, regardless of the kind of material from which it is constructed.

Swivel heads are of equal importance when curves of short radius are encountered in the rail. If all four load-carrying wheels were locked together, the flanges on the wheels would cut away the rail on the inside of the curves, even though the wheels were located very close together.

Another important fundamental design feature which should be incorporated in every electrically-propelled carrier is long wheelbase, as the greatest practical and possible distance between the wheels that carry the load. Strange as it may seem, the long wheelbase has a remarkable influence in preventing a load, suspended from the hoist, from swinging out of control when negotiating a curve at lively speed. This feature of long wheelbase is just as important to the electrically-propelled carrier as it is to those pushed by hand.

The production of gold, silver, copper, lead and zinc in the Eastern States in 1928 is covered in a pamphlet of 8 pages, including tables of production and value, as well as prices, published by the United States Bureau of Mines.



Counter-Flow Furnace of the Pusher Type with Automatic Temperature Control Is Used for Annealing the Hub Shell Between Press Operations

Service Piping for Welding Gases

Aircraft Manufacturer Finds Many Advantages in Central Supply of Oxygen and Acetylene, Serving Pipe System Extending Through Shop

BY F. J. FITZGERALD*

AS is well known, the year 1929 witnessed a great expansion in the aircraft industry, not only by established plants but also by the construction of new factories. "It is noticeable," wrote J. B. Johnson, chief of the material section of the Army Air Corps, "that oxy-acetylene welding has been adopted almost universally. The principal reason for its preference is its adaptability to thin metal. The weld metal built up forms a smooth fillet and tapers off gradually into the base metal. The increase in production schedules does not seem to be limited by the use of oxy-acetylene welding for joining the various parts of the structure."

"To facilitate production some of the factories have installed acetylene generators and are piping acetylene and oxygen to convenient locations in the plant. Obsolete equipment is being discarded in favor of the newer types of torches which are being produced and which are better adapted to welding in places where access is difficult. The torches generally preferred are light in weight and have a small flame which can penetrate and melt the metal in the corners formed by two abutting members."

Such trends as sketched by Mr. Johnson are exemplified at the plant of Arrow Aircraft & Motors Corporation, Havelock, Neb. Manufacture by oxy-acetylene



welding on a mass production basis, as is possible in such departments as illustrated, immediately brings to the front the problem of proper handling of oxygen and acetylene. The standard portable equipment, of course, is the cylinder—the oxygen cylinder containing 220 cu. ft. (when measured at atmospheric temperature and pressure)

compressed to 2000 lb. per sq. in. The acetylene cylinder is heavier, being filled with porous solid, and saturated with liquid acetone in which is dissolved approximately 300 cu. ft. of acetylene gas.

Where there is much welding to be done in a restricted space, and a large number of cylinders have to be moved about, cylinder handling is by no means an insignificant item of expense. It also interferes with the movement of other materials, and may even retard production schedules. Every operator working directly from cylinders spends a certain amount of time changing regulator and hose connections from empty to full cylinders. In proportion to his total welding, the time thus spent is small, but when many operators are working steadily, the time spent changing cylinders will total a fairly large figure during a month.

Finally, an especially careful check on "empty" cylinders is necessary to insure that the gas contents are drawn down to the lowest working pressure. An operator has a tendency to discard a cylinder which is partly full at a time when it suits



Fuselage Skeletons Start as Short Pieces of Steel Tubing at Far End of Shop and Progress Through Subassemblies Made on Various Benches to Main Assembly Jigs in Foreground

*Technical publicity department, Linde Air Products Co., New York.

†Address to International Acetylene Association, Chicago, Nov. 13, 1929.

his convenience to get a new one; and unless carefully watched, large losses may occur in this way.

Welding Gases Where and When You Want Them

All these difficulties are avoided by piping the plant for oxygen and acetylene distribution. There is no cylinder handling on the production floor at all. Oxygen cylinder handling is confined to the manifold room which is provided with a convenient platform for receiving and shipping. Since it is all done at one central point, there is a decided saving in the time and money spent in handling and accounting for cylinders.

Use of an acetylene generator entirely eliminates handling of acetylene cylinders. There is, of course, an equivalent amount of calcium carbide to be unloaded and charged in the generator, but this involves a comparatively small amount of labor.

A typical installation of service piping for welding gases is shown in the accompanying photographs taken at the plant of the Arrow corporation.

Pipe mains are carried just under the ceiling; drops are placed at all the interior columns and at many places directly over work benches and jigs where the welding on the fuselage skeleton is to be done. "Such an installation not only provides the most economical method for distributing gases but also insures uninterrupted production and enables each operator to work under the most efficient conditions.

Acetylene generator, carbide storage and oxygen manifold are located in a separate building designed for this purpose. The generator, visible through the door shown at bottom of page, is of the low pressure duplex balance seal type which assures a continuous supply of acetylene. One of the duplex generators is supplying the gas holder while the other is disconnected for cleaning and recharging.

Carbide residue, which is really a high quality hydrated lime, is drained out of the generator into a pair of pits at the rear of the house. While one pit is being filled, the residue is settling in the other. When thoroughly settled, the clear water is drained off and the thick pasty residue shoveled out. It has a ready sale to builders, who make brick laying or plastering mortar with it, or to farmers for whitewash spraying or lime fertilization. This gen-

erator house, separated from the other manufacturing buildings, has been constructed according to the fire underwriters' rules, and is in sole charge of a mechanic who is thoroughly conversant with the precautions and safe practices to be observed.

Oxygen Manifold a Special High-Pressure Unit

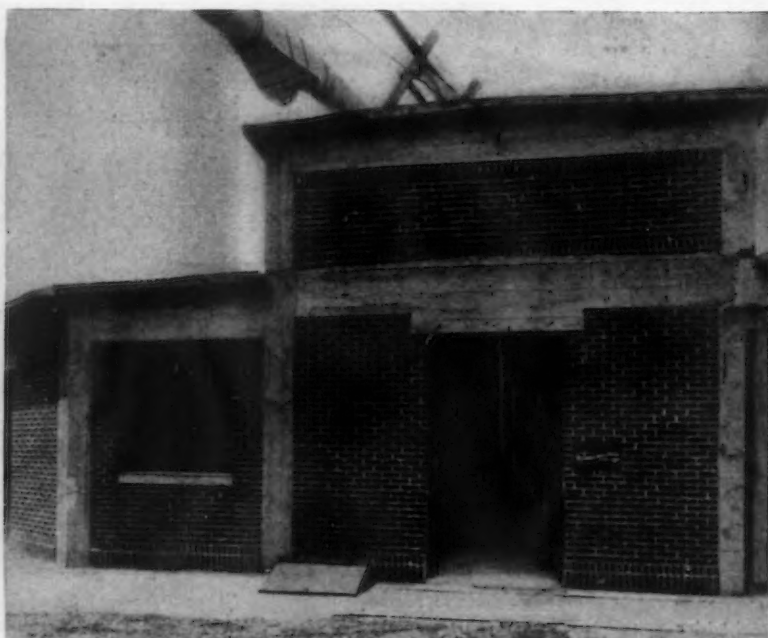
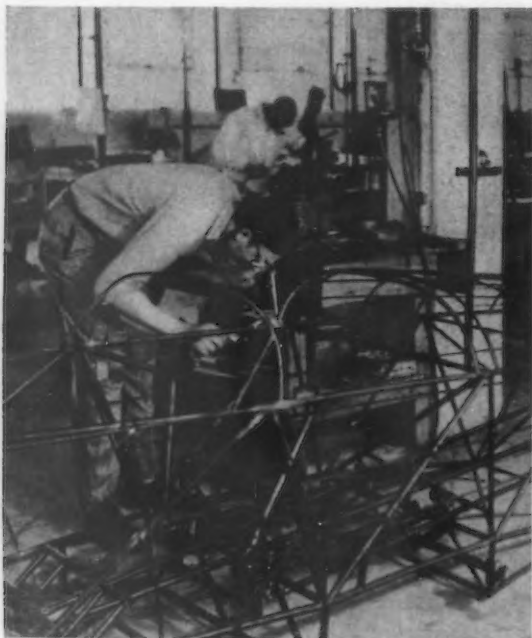
An entirely separate room in this house holds the oxygen manifold. This is a double-extra heavy pipe header, with pig-tail connections for the individual cylinders, divided into two sections by appropriate high-pressure valves so that one end will be discharging into the supply mains while the other bank of cylinders is being replenished. Special heavy duty pressure regulators reduce the pressure from that existing in the discharging cylinders to the constant pressure required for successful blowpipe operation. A quick action line valve is also installed for closure whenever the fire alarm rings.

All this equipment, which is amply safe under the 2000-lb. pressure of full oxygen cylinders, was built by Oxweld Acetylene Co., and is similar to its installations found in the principal railroad repair shops throughout the country.

In the design and installation of the gas piping throughout the plant, the Arrow company had the cooperation of service engineers of the Linde Air Products Co. The pipe lines are of extra strong steel pipe with welded line joints and branch connections. In the design, due attention was given to the probable rate of delivery required at the various outlets, and the pipe sizes so chosen as to avoid undue pressure drop. Special care is also necessary to see that the piping is properly graded to avoid low spots wherein moisture may accumulate, condensed from vapor carried by the oxygen or acetylene. Following recognized good practice all pipe, valves and hose carrying oxygen are painted green; acetylene lines are red.

Station Regulators Correct Minor Pressure Changes

One of the illustrations shows a typical welding station at a building column, and another shows four drops placed above a jig used for the main fuselage assembly. As low pressure acetylene is used in this installation the acetylene line does not require a station regulator but is



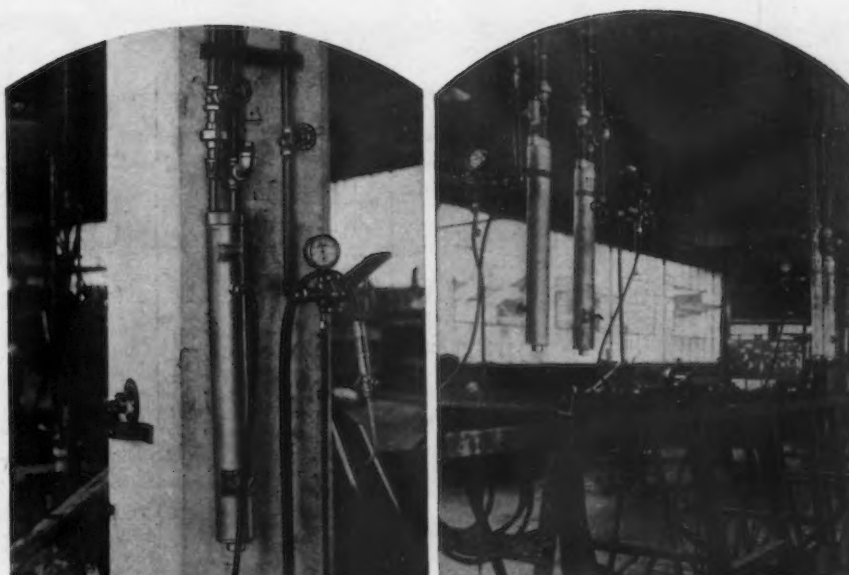
Welder Making Joint in Cowling Frame (Left). House for sheltering acetylene generators. Separate room at left contains oxygen manifold

provided with a "hydraulic back pressure valve" which contains an effective water seal against a reverse flow of oxygen through the blowpipe passages backward into the acetylene piping.

The oxygen line is provided with a station regulator.

Use of pressure regulators at oxygen outlets calls for some comment. One of the important savings of piped oxygen (especially apparent in large scale cutting, as in steel foundries) is that the wasteful use of excessively high pressures is prevented. Obviously,

if an operator hooks his equipment to a cylinder of oxygen, he can use any pressure he wishes, up to the maximum existing in the cylinder, and generally it is



WELDING Station Affixed to Building Column. Hydraulic seal against back pressure on acetylene line at left; oxygen pipe and regulator at right; hose connections to special blowpipe for thin-walled aircraft tubing (left). Four welding stations dropped from ceiling to handy positions over main assembly jig (right)

true that one of the hardest things to teach welders and cutters is that there is a certain pressure which gives the most economical results, when labor time and gas cost is a minimum for unit production.

When a piping system is installed, the workman's tendency toward unduly high pressures is controlled by the fact that the pressure on the whole system is limited by the master regulator at the oxygen manifold to that which will deliver the correct operating flow at the most distant out-

let. The station regulators, however, are necessary to smooth out the fluctuations in a pipe main inseparable from a variable flow of gases.

Gives Data on Inspection Costs in Various Types of Plants

DATA on costs of inspection and percentage of spoiled parts in a number of industries were part of a comprehensive paper on "Quality Control and Production Gages," presented by Earle Buckingham, associate professor of engineering standards, Massachusetts Institute of Technology, Cambridge, Mass., at the fiftieth annual meeting of the American Society of Mechanical Engineers.

"The following statistics on cost of inspection represent the per cent of payroll for inspection as compared with the total payroll factory cost of the product. The per cent of scrapped parts represents the per cent of spoiled parts because of faulty workmanship or material, as compared to the total production.

CLASS A.—Household and office appliances such as washing machines, sewing machines, calculating machines, typewriters, telephone equipment, etc.:

Cost of inspection, from 2 to 7 per cent.

Scrapped parts, from ½ to 5 per cent.

These percentages vary in the different departments.

CLASS B.—Machine tools, electric motors, turbines, etc.:

Cost of inspection, from 5 to 7 per cent.

Scrapped parts, from 1 to 7 per cent.

CLASS C.—Automobiles, agricultural machinery, gasoline engines, etc.:

Cost of inspection, from 4 to 10 per cent.

Scrapped parts, from 2 to 7 per cent.

CLASS D.—Standard small tools, gages, etc.

Cost of inspection, from 10 to 20 per cent.

Scrapped parts, from 5 to 25 per cent.

CLASS E.—Special tools, gages, fixtures, etc.:

Cost of inspection, from 25 to 50 per cent.

"The cost of inspection on different types of productive equipment, even in the same plant, or different part of the

product, some simple and others more intricate, varies considerably in these figures. Thus in one plant with an average inspection cost of about 7 per cent, the inspection costs in different departments vary from 2 to 29 per cent. In another plant whose average inspection cost is about the same, these inspection costs vary from 1 to 67 per cent in different departments.

"Even on the same type of manufacturing equipment, these inspection costs vary, depending upon the requirements of the product. For example, in automatic screw machine departments, the cost of inspection on the average product may be as low as 1 or 2 per cent, while on parts with very close tolerances where the product must be watched continually, this cost may increase to over 10 per cent.

"One interesting example comes from a large plant manufacturing a wide variety of products. On two similar products, the first being quite completely tooled up and provided with gages for rapid inspection, while the second has a minimum of such equipment, there are the following percentages:

	First example	Second example
Cost of inspection ..	1 per cent	7 per cent
Scrapped parts	½ per cent	7 per cent

Prof. Buckingham's paper included discussion of basic principles relating to quality control and the use of production gages. Elements which form the groundwork for manufacturing operations, such as development of manufacturing design, testing the design with a manufacturing model, determining the proper manufacturing tolerances and recording suitable information on component drawings, were taken up. This was followed by consideration of the facilities that should be provided for checking the results of the manufacturing work.

Alloys That Resist Heat—II

Strength at High Temperature, Corrosion and Oxidation —Many Phenomena Debatable—Roles of Nickel, Chromium and Silicon

BY T. HOLLAND NELSON*

THE author feels very strongly that the original principle, so often advanced in regard to stainless steels, that a definite amount of chromium in iron is necessary to render it insoluble, is substantially true but has been little explored in regard to high-temperature corrosion and oxidation. Just as much as it has been found desirable to add increasing quantities of chromium to iron to render it satisfactory for more powerful corrosive reagents (i.e., stainless steel for cutlery, varying from 10 to 14 per cent chromium content, to chromium-iron used for nitric acid installations, containing from 16 to 20 per cent of chromium), so do I feel that we shall ultimately establish that corrosion by gases at high temperatures will be counteracted by definite alloy contents deliberately added to produce metal free from attack by corrosive gases.

By this I do not mean for one moment that future heat-resistant alloys will be dependent upon their chromium content alone, any more than I would suggest a high-chromium steel to withstand sulphuric acid. What I do mean, however, is that where chromium is the element which offers resistance, graduated chromium contents will be the basis of meeting the condition.

Nickel may be added for other purposes but, fundamentally, where an alloy containing chromium is found satisfactory, other elements will be subsidiary and added only for the purpose of fabrication or to obtain definite physical properties.

On the other hand where alloys with nickel predominating are more satisfactory than chromium, chromium

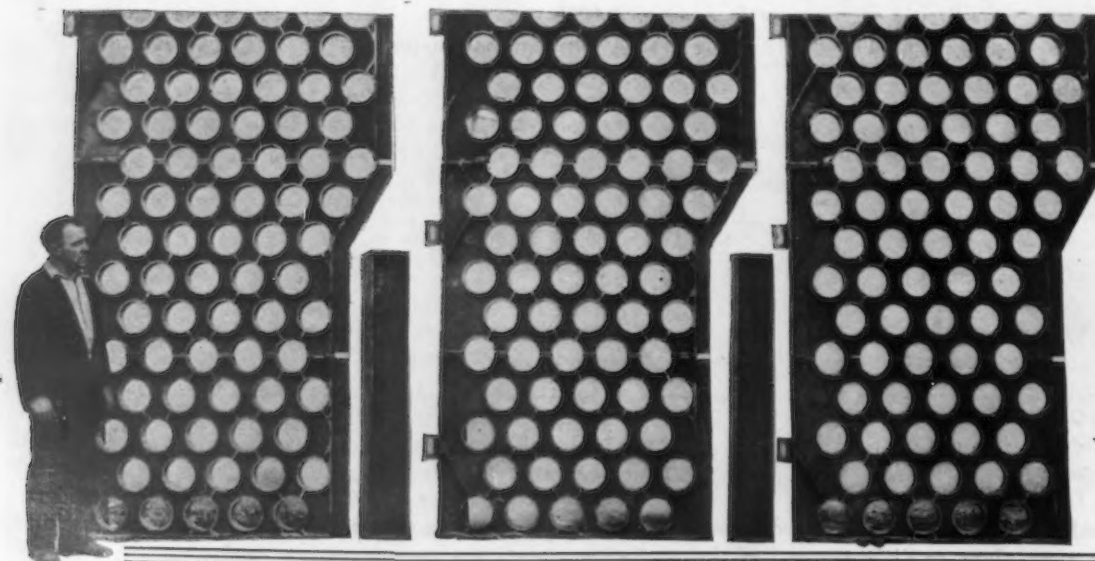
and other alloys will only be added in such smaller proportions as may be requisite to obtain again the desired physical properties. There will, of course, always be exceptions to the rule.

The Nickel, Chromium and Silicon Alloys

ONE striking illustration of this is probably the recently developed alloys of nickel-chromium-silicon and nickel-silicon, which are found very satisfactory in corrosion resistance against sulphuric or hydrochloric acids. In this field the simple chromium alloys are of no value whatever. Also, silicon forms an important addition to either the chromium, the nickel or the chromium-nickel alloys and in this respect stands out almost alone. It is equally true that silicon considerably aids resistance to corrosion at normal temperatures.

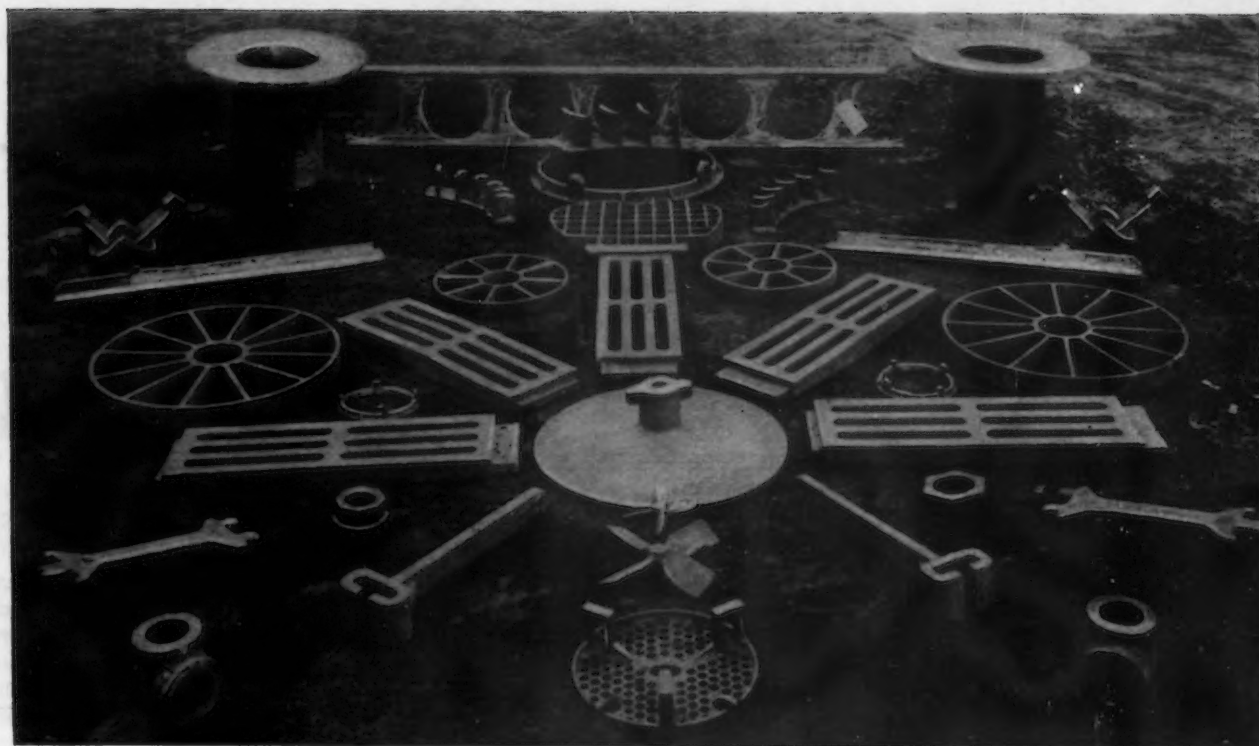
The author, of course, finds it extremely interesting to follow the line of thought that a satisfactory heat-resistant alloy is really a corrosion-resistant alloy which possesses the physical properties required at a given temperature and which the metallurgist so constitutes chemically to resist the corrosive elements under operating conditions.

Again let me at this point refer to the excellent work which is being done in some of the finely equipped laboratories in the country as to its value. If my article attains the desired object, it will bring home the thought to the designing or chemical engineer that he may make a grave error of judgment to accept figures obtained under one set of conditions. For instance, to accept a physical strength of any alloy pulled at temperature in oxidizing conditions as being safe, even with excessive factors of



TUBE Supports Designed for Use in Oil Refineries, Where By-Products of Combustion at Elevated Temperatures Are Often a Serious Factor (Courtesy of Midvale Co., Philadelphia)

*The author is consulting metallurgist, Widener Building, Philadelphia. Conclusion of article in *THE IRON AGE*, Feb. 6, 1930.



Castings Designed to Combat Either Oxidation or Chemical Attack at Elevated Temperatures (Courtesy of Chrome Alloy Products Co., Conshohocken, Pa.)

safety, and to apply the figures to entirely different conditions, such as in contact with chemicals, complex gases or the by-products of combustion.

Corrosion Different from Strength at High Temperatures

In writing thus, I do not wish to infer for one moment that the manufacturers of various heat-resistant alloys are not doing their best to produce a high-grade alloy for the particular purpose required. Nor am I blind to the fact that for many purposes standard alloys are satisfactory, but from time to time I am called in to examine failures attended by serious and sometimes fatal results, which might possibly have been avoided had the subject been regarded in the light of possible corrosion at high temperatures rather than "strength at temperature" and "freedom from oxidation."

In short the author believes it is impossible any longer to regard the selection of a satisfactory material to meet high temperatures in the presence of by-products of combustion according to any definite standard of chemical analysis, based simply on strength at temperature and resistance to oxidation. He firmly believes that, in this field particularly, special alloys are demanded. By-products of combustion may exist in so many different forms that operating in one temperature range, one alloy may be perfectly satisfactory and in a different range equally unsatisfactory. The fact is not because of physical weakness or tendency to oxidize, but because varying corrosive conditions exist in different ranges.

Corrosion versus Oxidation at High Temperature

Again may I raise the question: Is it not very often corrosion at high temperatures which we have in the past so flippantly termed oxidation? Without wishing to attack the composition of the various alloys offered to the trade, is it reasonable to leave the thought prevalent that there may be cases where chromium may substantially resist corrosive condition when nickel might be attacked or in other cases where nickel may be the element

resisting the corrosive condition and the chromium itself, or the iron, as the case may be, be the elements that are subject to attack?

Further, in advancing a thought in connection with these iron-chromium or chrome-silicon-nickel combinations, is it not possible, by a deeper study and investigation of the subject, that we may find it possible to establish entirely different ratios, now more or less standardized, that are likely to be much more efficient than some of those now in service.

Responsibility of the Patent Situation

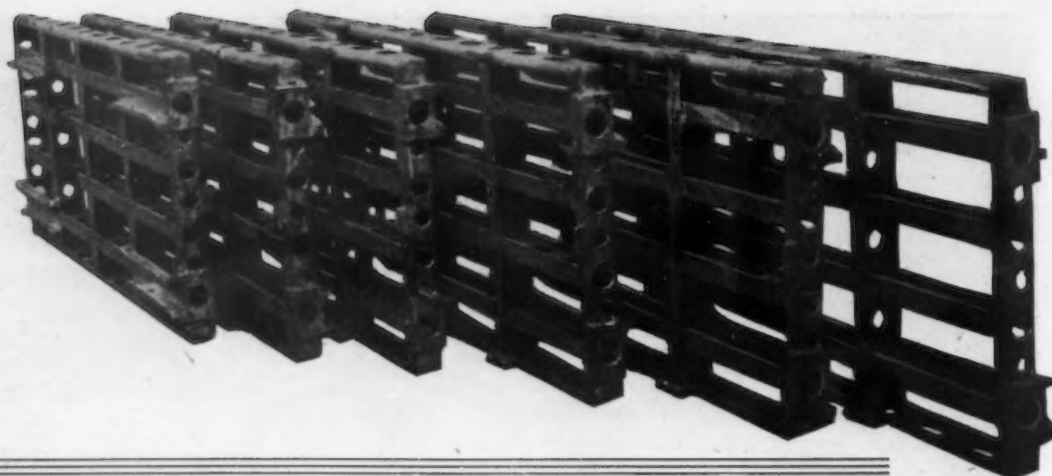
The patent situation on this subject has been largely responsible for manufacturers' producing certain definite analyses. Unfortunately, at times, those with wider vision are unable to produce alloys that they may be aware of as satisfactory but not within the bounds of patents they control or find it possible to operate under. The real urge, therefore, will come in the form of intelligent demands from the ultimate user who, if he regards his high-temperature problem as a corrosive problem, will find that entirely different ratios than he has up to the present found available are necessary to meet those corrosive conditions. He may find it necessary at times to concede something in strength to attain immunity from attack, or in other words, the permanence of the installation.

And may I again ask a question: In how many cases would it seriously affect a designing engineer to have to use say 1½-in. section against a 1-in. section, if the 1½-in. section represented strength and permanence, whereas the 1-in. section represented strength only and subject to attack by corrosion?

Phenomena Still Debatable

THE phenomena governing the resistance to corrosion, and I venture to say corrosion at high temperatures also, is still the subject of considerable debate. There are those holding the view that a definite oxide layer creates a condition of passivity or protection. There are those

A GROUP of Intricate Castings for Conveying Tables or Trays Made from Intermediate Nickel-Chrome Alloy. (Courtesy of Midvale Co., Philadelphia)



holding views that fundamentally the material is insoluble under the given conditions and various other viewpoints, all of which could be carried into this same field of high temperature work. I agree that it may be that an oxide layer can be produced to act as a protective coating against further penetration. I am convinced from experience that some elements in heat-resistant alloys are actually soluble in gases, and so I leave this highly technical and debatable subject still in the hands of those who have done such excellent work in it.

Some of Dr. Hatfield's Work

Reference has been made to a number of investigations. The author, however, will content himself with the more recent one of Dr. W. H. Hatfield,* reported in a paper before the (British) Iron and Steel Institute. A series of alloys were exposed at elevated temperatures to various gases. The effect on varying percentages of chromium and also of pure chromium and pure nickel, I feel, thoroughly support the thoughts put forward in this article.

I have taken the liberty of bringing together in a different type of table some of the figures published by Dr. Hatfield.†

These figures, in this form, show at a glance the effect of materials under varying conditions and how possible it is for a material ideally suited for one set of conditions to be seriously affected in another. The rearrange-

ment of Dr. Hatfield's figures has been undertaken purely for this purpose.

The author has been able to confirm in a practical way many of the results obtained by Dr. Hatfield, which he feels will have a distinct bearing on the development of new alloys to combat attack at high temperatures. He would strongly advise those seriously interested in the subject to make a close study of Dr. Hatfield's paper.

Nickel, Chromium and Silicon to Solve Problems

I AM firmly convinced that most of our heat-resistant problems will ultimately be handled by certain ratios of nickel, chromium and silicon primarily, silicon having already demonstrated its remarkable efficiency both in the field of normal-temperature corrosion with many liquids, as well as gases.

There is also little known of the possibilities in the direction of using various aluminum contents. So far, however, the use of substantial amounts of aluminum has led to embrittlement in the lower temperature ranges, which is to be regretted because definite aluminum contents have been found distinctly advantageous in combating oxidation and corrosion at elevated temperatures.

Other additions, such as tungsten, molybdenum, titanium, cobalt, etc., will, I feel, play an important part as factors in controlling the physical properties and metallographic structure, but I do not feel that they are going to assist us in any marked extent in combating either oxidation or corrosion.

Relative Corrosion Figures as Obtained by Dr. W. H. Hatfield, Iron and Steel Institute, Vol. 2, 1927

Description	Material	24 Hr. at 900 Deg. C.						24 Hr. at 1000 Deg. C.			
		Complex Atmosphere of Un-enclosed Gas Muffle			Oxygen			Steam	Carbon Dioxide	Sulphur Dioxide	Comp. converted
		Industrial Gas	Gas	Muffle	Oxygen	Oxygen	Oxygen				
	Pure iron.....	114.012	95.34	141.60	178.390	175.515	175.515				
	Chromium.....	2.051	1.00	6.309	2.110	3.084	3.084				
	Nickel.....	5.222	16.83	9.693	4.385	4.558	4.558				
	Cobalt.....	.....	.....	119.474	73.549	15.048	289.821				
	Copper.....	.....	.....	.....	.....	.....	.....
	Tungsten.....	.....	.....	.....	.....	.....	.....
	C. Si. Mn. Cr. Ni. W. Cu.										
Mild carbon steel.....	0.17 0.18 0.67 ... 0.25	80.225	73.104	170.860	231.051	93.460	converted				
3 per cent nickel steel.....	0.34 0.29 0.60 ... 3.25	72.893	43.30	230.286	91.914	151.339	converted				
36 per cent nickel steel.....	0.24 0.16 0.40 0.09 36.90	30.058	27.70	25.548	54.541	30.734	256.447				
Chrome-silicon steel.....	0.50 3.04 0.37 8.28 0.16	0.84	0.506	2.94	1.355	0.841	3.235				
Chrome steel (stainless type).....	0.32 1.32 0.25 13.12 0.29	18.319	20.500	91.30	39.841	62.283	58.616				
Chrome iron.....	0.09 0.37 0.39 18.53 0.26	1.252	1.38	2.886	3.260	2.948	1.433				
Chrome-nickel alloy.....	0.11 0.21 0.34 14.84 10.16	6.000	3.84	43.577	43.439	37.008	3.748				
Chrome-nickel alloy, 18-8 type.....	0.12 0.31 0.28 17.74 8.06	2.699	0.326	5.659	17.456	5.85	2.633				
Nickel-chrome alloy.....	0.35 0.21 1.36 10.90 35.15	2.534	1.01	19.305	16.027	11.654	7.939				
Chrome-nickel-silicon alloy.....	0.58 4.00 0.36 15.54 8.14	0.689	0.061	1.806	1.496	0.584	2.412				
Chrome-nickel-tungsten alloy.....	0.30 1.46 0.52 17.74 7.00 4.23	0.43	0.175	3.489	2.765	0.922	0.829				
High-nickel-chrome alloy.....	0.06 0.71 0.89 11.69 60.40	1.397	0.765	1.778	1.434	1.134	91.104				
Cast iron.....	3.20 1.13 0.72	86.000	33.80	427.546	238.353	40.568	converted				
15 per cent silicon iron.....	0.79 14.30	78.434	13.734	78.651	418.304	29.473	160.396				
Monel metal.....	0.14 0.03 1.00 ... 69.98 ... 27.17	68.676	1.55	.....	.....	.....	.....

NOTE: The index figure used is the increase in weight in milligrams per square centimeter of surface. Tests were made over periods of 24 hours at temperatures indicated.

What Railroads Will Spend in Six Years

Capital Expenditures Estimated at Four and Three-quarters Billions
—Outlay for 1930 to Exceed a Billion

BY LEE G. LAUCK*

THE authority conferred upon the Interstate Commerce Commission by the Transportation Act concerning the regulation of security issues particularly stresses the importance of preventing excessive amounts of securities from being issued or funds thereby raised from being improperly used. Thus, its criticisms and suggestions regarding railroad financing carry great weight.

Figures from authoritative sources indicate that the capital expended by the railroads for additions and betterments and improvements to properties during the past year totaled over \$800,000,000. Of this amount it is estimated that \$300,000,000 was expended for equipment and \$500,000,000 for roadway and structures. The total amount shown for 1929 compares with total capital expenditures for the years immediately preceding as follows:

Year	Amount
1920	\$653,260,000
1921	557,035,000
1922	429,273,000
1923	1,059,149,000
1924	874,744,000
1925	748,191,000
1926	885,086,000
1927	771,552,000
1928	676,665,000
1929 (Est.)	800,000,000

During the 10 years from 1920 to 1929, inclusive, marking the period since the termination of Federal control, it will be noted that the railroads of the United States spent \$7,454,955,000 for the improvement of their properties. Even more outstanding is their work for the past seven years, during which time they have expended \$5,815,387,000, or an average of about \$830,770,000 annually. The prospect for this year is a larger program than in 1929. It will be considerably in excess of a billion dollars. Expenditures for the first six months of this year are estimated at \$490,000,000, an increase of \$140,000,000 over the first six months of 1929.

On the Rock Island, for instance, where improvement work was held to a low level until the last three or four years, it is planned to spend nearly \$50,000,000 this year, the largest program ever undertaken by this property.

*Economist, Washington.

Other large budgets include those of the Santa Fe, \$40,700,000; the Southern Pacific, \$50,000,000; the Baltimore & Ohio, \$32,000,000; the St. Louis-San Francisco, \$22,000,000; the Great Northern, \$19,000,000; the New York, New Haven & Hartford, \$18,700,000, and the Boston & Maine and the Illinois Central, each \$16,000,000. This gesture of the railroads toward adding to their facilities affords evidence that they intend to keep ahead of the demands that may be upon them in periods of sudden increases in traffic. It also indicates optimism regarding conditions immediately ahead.

Large Appropriations Carried Over

Unexpended authorizations carried over from 1928 into 1929 amounted to \$372,000,000, and those carried over from 1929 to 1930 exceeded \$655,000,000, which indicated a total of \$283,000,000 more carried over into this year than was brought over into 1929. The total capital program for 1929 was approximately \$1,455,000,000. It was not to be expected, however, that all this money would be spent during that year, because some of the work would of necessity be carried over into the present year. If business returns to a high level during the remainder of this year, as many railroad executives and other industrial leaders anticipate, it is to be expected that improvement authorizations will be increasingly liberal and that the carryover into 1931 will be correspondingly greater.

A careful study of the railroad funded debt maturing each year, based on funded debt actually outstanding on Dec. 31, 1925, and covering 85 per cent of the total funded debt of all the steam roads in the United States, reveals that the average amount of refunding necessary each year for the 10 years 1926 to 1935 will reach approximately:

	Average Yearly Refunding
Mortgage bonds.....	\$128,625,375
Collateral trust bonds.....	57,523,148
Income bonds.....	3,811,087
Miscellaneous obligations.....	21,437,349
Equipment trust obligations....	89,016,057
Total funded debt.....	\$300,413,016

Events sometimes transpire that radically alter the policies of the railroads relative to expenditures. How-

Estimated Additions in Next Six Years

Trackage....	23,000 miles	Locomotives....	7,920
Freight cars....	435,000	Passenger cars....	7,380



ever, the executives do not believe there is anything in existing conditions to warrant a reduction or abandonment of any part of their present program. The demand for railroad service is constantly increasing. There may be an occasional falling off in this demand, due to temporary business conditions, but nothing is more certain than that there will continue to be a progressive increase in the demand for railroad service as the country grows.

Estimated Expansion in Traffic

Railroad service enters into and is essential to the conduct of all forms of business, and naturally business must expand to meet the requirements of national development. The growth of railroad service in the past 46 years may be seen in the following figures, showing the number of tons of freight carried one mile in the years indicated by decades, with 1929 added:

	Tons Carried One Mile
1883	30,064,923,445
1893	93,588,111,833
1903	173,221,278,993
1913	293,722,528,693
1923	413,562,132,000
1929 (Est.)	489,000,000,000

There is no doubt about the continuance of the growth of railroad traffic, although there may be a difference in opinion upon the rate of growth that should be expected. Several years ago a study was made of this question and at the time it was estimated that between 1925 and 1935 there probably would be an increase of 33½ per cent in the number of tons of freight carried one mile. This estimate is less than the actual increase in any of the four ten-year periods shown above.

In 1929 the railroads handled all the traffic that was offered (the greatest ever handled in one year) without marked congestion or delay. But in 1929 the railroads operated practically at capacity throughout the year, and it is obvious that more facilities of every kind will be needed to move the increasing traffic of the future.

Expenditures in Next Six Years

According to an authoritative estimate the railroads will be required to make the following additions to their important facilities in the next six years: Trackage, 23,000 miles; locomotives, 7920; freight cars, 435,000; passenger cars, 7380. To obtain these and other improved facilities it is further estimated that the railroads must spend in the next six years, in addition to their actual expenditures for maintenance, a total of approximately \$4,724,000,000, or an average of more than \$787,000,000 a year. This estimate corresponds roughly with other estimates that have been made in the past several years.

Most of the money that is to be spent for better facilities will have to be borrowed. Ability to obtain credit largely determines railroad expansion, and the prospective growth of business demands that the railroads have adequate credit. In other words, there must be left (after payment of operating expenses, taxes and other charges against income) a balance sufficient to assure persons having money to invest that it is safe in railroad investments. If the railroads are not allowed to raise and spend this money, or whatever sum is found to be needed, every form of business will suffer as a consequence.

Battle-Deck Roof for Mill Building

TO provide additional working space, the Youngstown Welding Co., Youngstown, Ohio, built a mill-type building by arc welding. It is 140 ft. long, with a main crane aisle 30 ft. wide and a lean-to 20 ft. wide. All columns, roof and crane girders and eave struts are standard structural shapes except the girders over the crane way, which were constructed with a horizontal bottom chord and a slightly sloping top-chord, reaching a peak at the center. This was welded together of sheared plates.

An interesting detail is shown in the photograph here reproduced.

The building is roofed with No. 12 gage steel plate, arc welded into place on trussed bar purlins running longi-

tudinally. The plates overlap 1 in., the lower plate being tack welded to the supports, and the overlapping plate is welded continuously to make it watertight. The pitch of the roof is obtained by the camber of the girder in the main bay, and by raising one end of the beam in the side bay.

One of the most interesting points in the construction of this building is that all work was done from simple working drawings. No tracings or blueprints were made. According to Lincoln Electric Co., which released the information, this is one of the advantages of arc welded construction, both in the structural and machine tool industries.



Meeting Problems of Tool Steel Failures

Three Types of Oil-Hardening Steels—Tools Chromium Plated— Faulty Heat Treatment One Cause of Failures—Other Reasons

TOOl steel failures was the subject of an interesting address before the Cleveland branch of the American Society for Steel Treating, Feb. 10, by A. H. D'Arcambal, Pratt & Whitney Co., Hartford, Conn. However, the speaker did not limit his discussion to failures but considered rather broadly the entire subject of tool steel and developments in that industry.

Advent of the Induction Furnace

Starting with reference to changes that have taken place in the past ten years in the tool steel industry, Mr. D'Arcambal said that he does not know of any tool steel maker who is now using crucible furnaces to make carbon, alloy or high-speed tool steel. Melting in the Heroult furnace has been generally adopted and now this is being replaced to some extent by the induction furnace. He believed the induction furnace would turn out the better tool steel and that much of the carbon and high-speed tool steel will be made in the induction furnace. One maker claimed that tool steel melted in an induction furnace had a superiority in wear of 30 to 40 per cent over that class of steel made otherwise.

Formerly mills made several types of plain carbon tool steel but now very few make more than one type. Vanadium tool steel has come into rather general use the past two or three years in place of plain carbon steel because of its greater toughness.

The speaker referred to the three types of oil hardening tool steels that are in general use today. One contains 0.90 per cent carbon, 1.75 per cent manganese and has a narrow hardening range. The second has 0.90 per cent carbon, 1.75 per cent manganese and 0.25 per cent vanadium. A small amount of vanadium allows a higher quenching heat and a somewhat wider range in hardening. The third contains 0.90 per cent carbon, 1.25 per cent manganese, 0.50 per cent chromium and 0.50 per cent tungsten.

High Draw for High-Speed Tools

High-speed steels now used have 18 per cent tungsten, 1.00 to 1.25 per cent vanadium, 3.50 to 4.50 per cent chromium and 0.70 per cent carbon. Quite a tonnage of cobalt tool steel is now being made, the cobalt running 8 to 10 per cent. The advantage of cobalt is that it gives rough turning tools longer life. However, cobalt cannot be used in high-speed steel made into fine cutting tools unless the tools are ground all over to remove the soft skin. All high-speed tools should be given a high draw after quenching to give them greater life and toughness.

A great deal of high-carbon, high-chromium tool steel is being used today for dies and some type of gages according to Mr. D'Arcambal. Nitralloy steels are excellent for drawing dies, although at present these steels are not tough enough. However, they will be improved, he said. Interesting experimental work is being conducted in nitriding a high-speed steel containing 1 per cent aluminum.

Tungsten carbide alloy was referred to by the speaker as an interesting development but still in the experimental stage. He attributed an important factor of its present cost of about \$450 per lb. to the expense that makers

incur in servicing it in consumers' plants. He believed that eventually its price would be much more reasonable.

Chromium Plating Tools

Turning to chromium plating Mr. D'Arcambal said that his company has been having cylindrical plug gages chromium plated after wear but had not been very successful in getting good plating work on the tools. However, some plants had secured very satisfactory results in prolonging the life of tools by chromium plating. One automobile manufacturer is chrome plating its lathe mandrels, greatly increasing their life.

Electric heating furnaces, the speaker regarded as superior to fuel-fired furnaces because of good control of the work.

For hardness testing, the Rockwell hardness testing machine has given very satisfactory results. His company has not discarded the file test. The Rockwell machine and file make a good combination for testing, he believed, but do not show cutting capacity. In his opinion the Vickers hardness testing machine has wonderful possibilities but the present high price of this imported machine prevents its more general use.

Causes of Failures

The speaker prefaced his discussion of tool steel failures with reference to changed conditions in the metal-working industry. With the requirements of present production methods, he said, tools of a type used ten years ago would now fail in a very few minutes. Plant management, he contended, often did not give proper attention to the selection of small tools. Much time is often devoted to the selection of a high-priced machine and, after this is purchased, the tools that are used with it are often bought on price rather than quality. He urged the need of having skilled men make tests to determine the best type of tools for different jobs.

Principal causes of customers' rejection of tool steel, according to replies to a questionnaire sent to several mills, were seams, pipes, improper annealing and lack of knowledge by the mill of the customer's requirements. Replies to the question as to why good steel makes poor tools showed that causes of failures included over-heating carbon steel tools, under-heating high-speed tools, failure to anneal high-speed tools before re-heating, fast and uneven heating of carbon steels, delay in tempering both carbon and high-speed tools, too short a time at the drawing temperature, improper hardening and improper drawing.

Three Factors Insure Good Cutting Tools

Photomicrographs taken in metallographic examination of the structure of various specimens of tool steels were shown on lantern slides. Mr. D'Arcambal said that as viewed under the microscope carbon tool steel should be well spheroidized and free from all traces of cementite net work. High-speed steel should be free from carbide banding, hook and crooked structure, envelope structure and massive segregations. A series of tests on carbon

(Concluded on page 622)

American and European Export Practice

Assured Quality and Promptness, Advertising Cooperation and Trial Orders Aid American Steel Mills in Export Trade

(Special European Correspondence)

THAT a low price level is not the only factor in the development and extension of steel export trade appears from a brief comparison of American and Continental export sales methods. With few exceptions European steel mills sell abroad exclusively through exporters, while the major part of American steel export trade is handled directly, only a small portion being sold through American exporters.

This difference serves to explain why there are so few brands shipped by Continental mills to foreign markets. The exporter is not wont to incur the expense of advertising to develop a market for a specific mill or its particular brand. There is then always the possibility that the customer may place future business directly with the maker, or through another exporter. In contrast, advertising of American steel mills appears in India, China, Japan, Argentina, Chile, in countries of South Africa and elsewhere.

Yet manufacturers' agents and importers in foreign markets are more inclined to deal with a Continental exporter than to seek the representation of an American mill, despite widespread advertising of the latter. This is caused by concern that when dealing exclusively with one mill there may be periods when the mill, heavily engaged with business, is unable to offer satisfactory deliveries or quote attractive prices.

Exporter's Quality Often Varies

The European exporter buys wherever he can obtain the product, sometimes at Düsseldorf and other times in Saarbrücken, or in Charleroi, Brussels or Kattowitz. He is always in a position to quote on prospective business, for if one mill cannot offer a low price or early delivery, usually another can. The disadvantage of this method of selling, however, is that the customer is never certain just what quality of materials he will obtain. A sizable purchase of a certain product may have been so satisfactory as to bring a reorder from the same exporter. Meanwhile, the exporter having found a lower priced source of supply ships material made by another producer and the quality may prove unsatisfactory. For this reason a buyer will sometimes be willing to pay the higher price asked by an American mill, because of the knowledge that he is receiving consistently the same quality.

For many years American and European sellers of steel have claimed that the other is offering excessively long term credits in different foreign markets. A comparison of the usual terms quoted shows that some variation exists, but that long term credits are not exclusively European or American.

The usual terms offered by European sellers to Cuba, for example, are 30 days, documents against acceptance of the draft; to Mexico, 60 days; to Canada, 14 days; while the American terms usually quoted to these countries are net cash against shipping documents. European sellers also offer longer terms than American in China, India and Brazil, but terms quoted by American sellers to Chile often range from 90 to 120 days, compared with 60 days offered by most European sellers. The terms differ in markets depending upon the customer, and the foregoing are mentioned only as bases of comparison.

American Mills Have Few Claims

In the settlement of claims and other disagreements, it appears that American sellers are inclined to seek legal redress. Disagreements and claims, however, are more frequent with European shippers than with the American mills. The opinion in most foreign markets seems to be that American mills live up to their agreements, delivering satisfactory quality at the time specified in the contract. With European exporters constantly buying from different sources of supply, claims are more likely to arise, for even the most reputable seller is unable always to guarantee quality and delivery exactly as promised.

Longer Firm Offers from United States

It is also noteworthy that American steel mills when cabling firm offers usually make them for periods of eight to ten days, whereas the European exporter in most cases is able only to quote a firm offer of about five days and often it is reduced to only three or four days. The longer time granted by American sellers aids the importer in a foreign market who wishes to make sales on the basis of a firm offer before actually accepting it.

Many American companies are handicapped in their foreign transactions by confining correspondence to English, whereas European exporters use

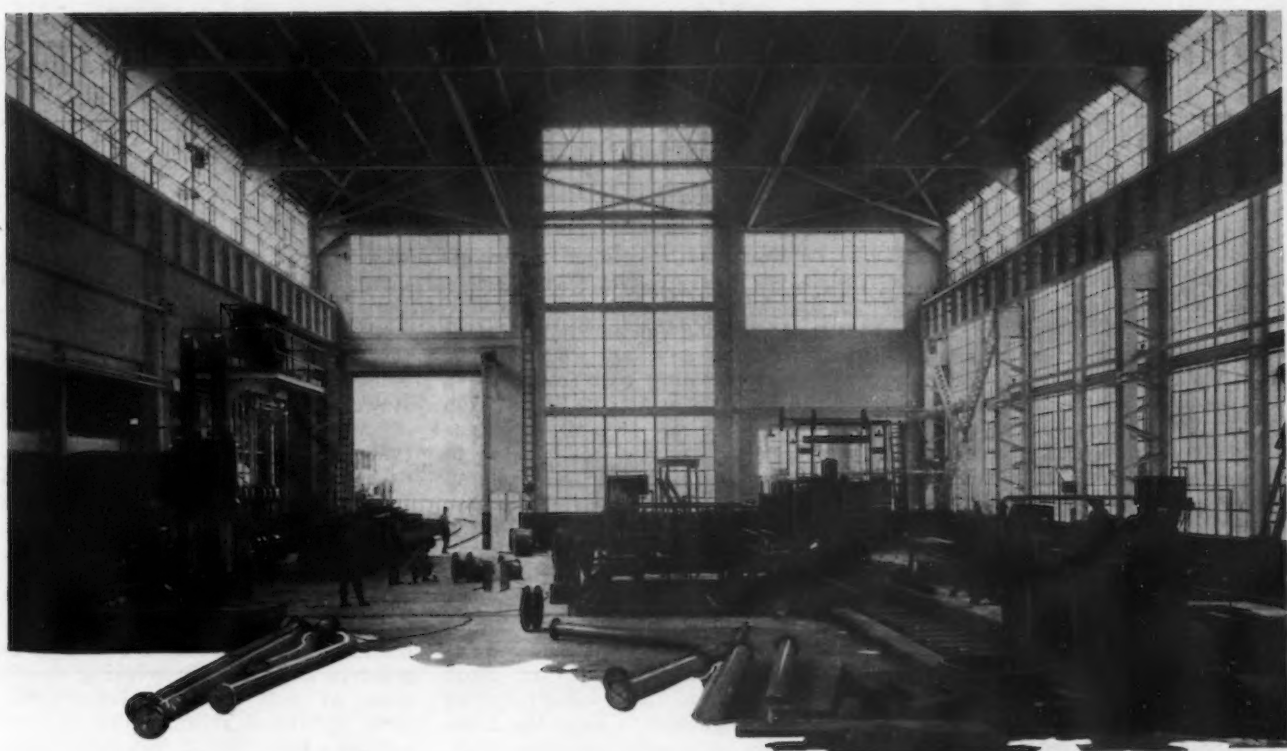
the language of the country with which they are dealing. Another disadvantage to American sellers is that practically all quotations are in dollars per gross ton, or per 100 lb., while the European exporter quotes per gross ton, metric ton, picul, or however required and in the currency most satisfactory to the buyer, whether it be American or Mexican dollars, pounds sterling, marks, francs, pesos, yen, taels or rupees.

Advertising and Samples Aid Exports

Such disadvantages are perhaps offset in part by the willingness of American companies to furnish ample trial shipments, sometimes as much as a few tons of material, without charge, and willingness to ship machines and equipment for expositions, furnishing agents with literature and booklets on their product. This is support that the European exporter is seldom able to obtain from Continental companies.

The European exporter is active in studying the psychology of his customers and the details of the market he is seeking to develop, and he is always prepared to meet his customers' ideas in sizes and designs rather than to try to sell the product as standardized in his own country. In this respect American sellers are inclined to exhibit more of the conservatism that leads them to care in selection of customers, resulting in fewer losses through bad debts.

To sum up, American steel brings higher prices in many cases than the European product, not so much because of superior quality, for Continental mills also produce high quality steel, but because the buyer knows what he will get from the mill in the United States (the standards of American mills being high), whereas some European mills produce high quality material and others cheaper products. The buyer of American steel also knows that his contract will be properly executed by a reliable producer of the product. In consequence, the United States receives a fair share of the steel business for prompt shipment of high grade material, while the European exporter takes orders placed on a basis of price and for forward delivery. As the latter type of orders covers a greater tonnage than the orders for prompt shipment, a greater volume of business goes to Europe than to the United States, for price, although not the only factor in export trade, is of considerable importance.



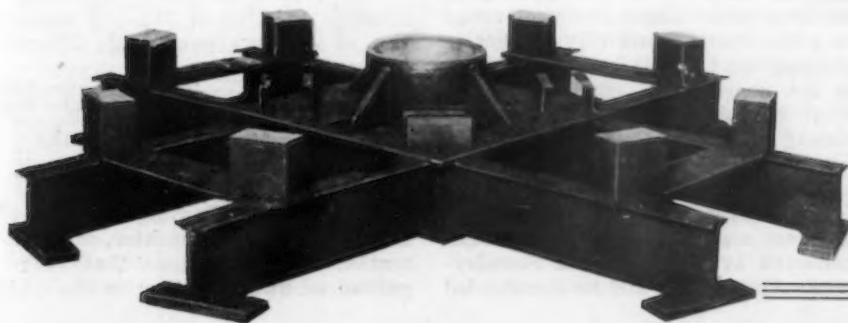
A Modern Welding Shop and Its Product

SO many applications of welded steel plate have been found at the East Pittsburgh shops of Westinghouse Electric & Mfg. Co. that a special building, entirely devoted to fabrication by welding, has been built. It is 75 ft. wide, 170 ft. long and 40 ft. high, and, appropriately enough, is itself of arc-welded construction.

The equipment within this welding shop is complete in every detail. A 15-ton overhead crane handles the heavy pieces, while massive roll and forming machines shape the various parts that go into the making of welded machinery. The apparatus now being constructed by the use of arc-welded steel includes motor frames, generator frames, motor rims, motor end bells, and many other parts equally as important.

At the right is a stator for a 94,200 kva. generator made here. It is 18½ ft. long and is made of rings cut from steel plates with automatic gas cutting machines.

The rings are held together on the inside by axial bars welded in place, and on the outside by steel plates bent to shape and welded on. The supports for the frame feet are also made from steel plates. The only machining required on the completed frame consisted of light bore cut on the axial bars to which the lamination rods are to be welded and some machining on the plates to which the feet are bolted.



BEARING Brackets for Generators Placed Above Water Wheels Are Important Parts of the Mechanism. The one illustrated is built completely of I-beams, rolled steel shapes and plates, with all joints welded. It is especially notable for its strength and low over-all height

Material Handling in the Small Foundry

Labor-Saving Equipment in Smaller Plants and Non-Ferrous Foundry Practice Discussed Before Ohio Foundrymen

ADVANCES in non-ferrous foundry practice and the subject of material handling in small foundries were the main topics of discussion at the winter sectional meeting of the Ohio Foundries Association, Inc., held at Miami Hotel, Dayton, Feb. 5. The former subject was presented by A. A. Grubb, metallurgical engineer, Columbus, while the latter was treated by W. B. Marshall, Chain-Belt Co., Milwaukee.

The meeting, the second to be held under the association's plan to have several sectional meetings in foundry centers each year in the place of one annual meeting, was very successful from the standpoint of attendance and interest shown. There was a registration of 85, representing a large number of foundries. A lunch was served at noon, and the discussion of the foundry subjects followed, taking the greater part of the afternoon. Don McDaniel, Hamilton, president of the association, presided.

First Cost of Equipment Important

Greater efficiency and lower costs can be effected in small foundries by using material-handling equipment, declared Mr. Marshall. Important things to be considered in installing such equipment in the small foundry are first cost and flexibility, he said. Also, the equipment must be kept operating, and it should be of small capacity, or of not larger capacity than needed, in order to keep down the installation cost. The speaker recommended an overhead monorail or crane for handling pig iron, coke and scrap. A lift platform truck with a dump box, he said, is satisfactory for cupola charging for rather small foundries. He urged the importance of having ample gangways with good smooth floors. Handling of sand often is the biggest problem in the foundry. The sand is usually handled four times. Small foundries should have economical sand-handling equipment and also conditioning machines. Sand control, he said, is desirable in any small foundry.

Taking up the subject of handling molds, he said that the molder has to carry about 200 flasks a day. These weigh on an average of about 50 lb. and the distance traveled in putting the flasks on the floor is about one mile, taking considerable time and involving the fatigue of handling. A foundry employing 10 molders on snap flask work, in the speaker's opinion, would be justified in putting in a mold-handling system. Such a system, he declared, would pay for itself in two or three years.

To illustrate economies to be effected by having conveying equipment in foundries, he said that the installation of handling equipment in a plant melting 25 tons a day would reduce the direct molding cost from \$18 to \$13.50 a ton, a saving of \$4.50 a ton in good castings. In addition, there would be a saving of \$1.30 a ton in the shakeout and \$2.40 a ton in scrap—a total of \$8.20 a ton, or \$225 a day, on the three items. Putting in the handling system would cost \$30,000. There would be various additional advantages, such as those that result from continuous pouring, reduction in amount of sand required, need of fewer flasks, improvement of labor conditions, reduction of labor turnover and encouragement to learn the foundry trades for apprentices who otherwise might choose less arduous callings.

For handling castings the speaker recommended the use of electric or hand lift trucks. He referred to the saving of hand labor by carrying castings to the cleaning room on waist-high conveyors, from which they are lifted to the grinding machines, then put back on the conveyor to go to the shipping room. He had found inclined power-driven escalators very efficient for use in loading cars, the trucks on which the castings are hauled being pulled up by the escalators to the car door.

Better Inspection of Raw Materials

There has been a decided advance in non-ferrous foundry practice in the selection and inspection of raw materials, declared Mr. Grubb. Formerly, he said, brass rarely got more than a visual inspection. Now the consumer analyzes his material for copper, tin, lead and zinc to see if he is getting what he is paying for. Ingots are now being tested to show the suspended particles of oxides and slags that give trouble. Producers of non-ferrous metals are giving more attention to the quality of compositions of the metal and are producing better metals than formerly.

More attention is being given to molding sand and to the blending of molding sand. There is a wide range in grain fineness and clay content in molding sand and it is of importance to the non-ferrous foundry to know what is going into its sand heaps. Ninety per cent of the troubles in non-ferrous foundries are due, he said, to clay content and tempering. He referred to the marked progress that has been made in the control of molding sand by the American Foundrymen's Association, and he commended

that association for its work in this direction. The grading system which the association has developed, he said, would be a great help, if followed, and the foundrymen are to blame for not using the system more generally. However, the whole story of molding is not told in grain fineness and clay content. Some core sands, he said, take about twice as much oil to bind them as others, and for this reason it is often cheaper to use some of the higher-priced core sands than the grades that absorb more oil.

Improvement in melting equipment and melting practice, he said, has been marked. There has been betterment in costs and in working conditions, at least for part of the products, by the substitution of electric furnaces for oil-fired furnaces at the plant of the Ohio Brass Co., Mansfield, with which he was formerly connected. At this plant 1000 and even 1400 heats of red brass have been melted with an Ajax-Wyatt furnace with one lining, and an arc furnace has worked out with about the same cost per ton. Fluxes and deoxidizers, he said, should be used with caution.

Temperature Control a Decisive Factor

Temperature control is the source of a great deal of trouble in non-ferrous foundries, according to Mr. Grubb. Pouring temperature is of great importance. Harm might be done if metal is overheated, even though it is chilled back to the proper pouring temperature. Overheating, he said, is far more dangerous than pouring at too low a temperature.

Trouble was experienced in the Ohio Brass Co. plant in making bronze castings that had to stand a bending test. The metal was first poured at 1950 to 2400 deg. Fahr. When poured at 1950 deg. it misran, and at 2400 deg. the castings looked good, but the metal was coarse and brittle and a large percentage of the castings cracked. A pouring temperature of 2050 to 2150 deg. was finally adopted, and since then no trouble has been experienced. The speaker gave the following results of tests, which show marked variation of physical properties of castings poured at different temperatures:

	Pouring Temperature 2050 deg.	2300 deg.
Yield point	12,000	8,000
Ultimate strength	31,650	16,850
Elongation	26	12
Reduction area	33	15
Brinell hardness	56	32

A. H. Kramer, Dayton, chairman of the foundry code committee, called attention to some clauses that he regarded as unsatisfactory in the Ohio

foundry code now being worked out by the State industrial commission, and urged members to voice objections in writing to any parts of it that they take exception to. Elmer F. Scott, secretary and manager, pointed out the need of an increase in membership

to carry on the work of the association. Walter F. Seelbach, president of the Gray Iron Institute, gave a brief talk, in which he said that foundries needed increased safety and medical examination of employees or prospective employees.

of questions varies with different kinds of establishments.

How will questionnaires be received?—Most establishments will be visited personally by a census agent, who will assist the proprietor in filling out the questionnaire. Approximately 6000 agents are employed. The larger establishments which are more familiar with the nature and purpose of the census will receive their questionnaires by mail.

How many kinds of classifications are made for distributors?—Eight general classes, which will be divided into many sub-groups: Wholesalers of all kinds; retailers of all kinds; manufacturers' sales branches; supply houses and equipment dealers; manufacturers' agents; hotels (room business only) and restaurants; building contractors; and automobile dealers and repair establishments.

What will the census produce?—The first broad, definite, statistical picture of the movement of goods through distribution channels, including (1) the number of outlets of all kinds; (2) how commodities move from producer to consumer; (3) cost of operation of distribution agencies. All this data will be classified geographically and arranged to show types, size of establishments and other pertinent facts.

When will the data be compiled and published?—The first preliminary reports may be available in the third quarter of 1930. It will take the whole year, however, and perhaps even more to finish the statistical picture of distribution, and to make the analyses which will show the true facts concerning commodity movements.

Questions Regarding Censuses Answered

Ernst & Ernst Clarify Purpose and Character of Government Surveys of Manufactures and Distribution

SUMMARIZING the plans and purposes of the biennial Census of Manufactures and the new decennial Census of Distribution, both of which the Government is taking this year, a bulletin of Ernst & Ernst, accountants, New York, gives answers to various questions which are expected to arise among manufacturers and distributors within the next few weeks, when they receive questionnaires from the Bureau of the Census at Washington or personal visits from census agents.

Two points need to be emphasized especially, the bulletin says. First, all information is given census agents in confidence, under heavy penalties against disclosure. Second, speed in filling out and returning the questionnaires is especially desired this year, and all business associations are urging their members to give prompt attention to the Government's questions.

The anticipated questions of manufacturers and distributors which Ernst & Ernst ask and answer in their bulletin are as follows:

When is the 1930 Census of Manufactures to be taken?—It has already started. Printed questionnaire forms are already in the hands of manufacturers or will be received within the next week or two.

How often is this census taken?—Once every two years.

What will this year's census cover?—Production in 1929.

Who will receive questionnaires?—Every manufacturer whose business was \$20,000 or more last year.

How many manufacturers are involved?—Approximately 200,000. The forms will be received and returned by mail.

Is it mandatory to fill out the questionnaires?—Yes, but the Census Bureau's policy is to encourage voluntary cooperation rather than to enforce penalty provisions of the laws.

When should the forms be filled out and returned?—There is no fixed date, but census authorities are making every effort to have this done at once, even within a few days after receipt of the forms. The Census Bureau then expects to compile facts for each line of industry and publish them promptly.

Will manufacturers be visited by census agents?—No, except in those cases where return of the forms is unduly delayed.

How many different groups of manufactures are established?—Sixteen, as follows: Food and kindred products; textiles and their products; forest

products; paper and paper products; printing, publishing and allied industries; chemicals and allied products; products of petroleum and coal; rubber manufactures; leather and its manufactures; stone, clay and glass products; iron and steel and their products, not including machinery non-ferrous metals and their products; machinery, not including transportation equipment; transportation equipment, air, land and water; railroad repair shops; and miscellaneous industries.

Are there sub-groups?—Yes, each of the above general groups is divided into a number of sub-groups. A total of 174 different kinds of questionnaires are provided. Most manufacturers will get only one. Some who make varied products may receive several.

Why do the questionnaires require such a great amount of detailed information?—Because manufacturers or their representatives in associations or groups have requested this. General information on the volume of production is relatively valueless in practical business operations. Manufacturers want to know more and more details concerning the output of their industry as a whole. Census authorities have tried to go as far toward breaking questions into detailed divisions as was expedient. They have not gone as far as some industries would like.

When will data be published?—Just as soon as all or a substantial proportion of the questionnaires from a given industry are returned. Possibly preliminary reports on certain lines will be issued in June, and they will trail along thereafter for many months. All depends on the degree of speed and cooperation shown by manufacturers themselves, most of whom may be expected to act promptly.

Is the census of distribution a new thing?—Yes, this is the first national census of distribution ever taken in the United States. A preliminary and somewhat experimental census was taken in 11 representative centers about three years ago.

How often will a census of distribution be taken hereafter?—Every 10 years, according to present plans; but probably more often.

How many establishments are included?—Approximately 2,000,000. This makes it the biggest business census ever undertaken in the world.

What kind of information is sought?—Actual figures for 1929, including number of salesmen or other employees, wages paid, rent, interest, other expenses, stocks on hand, cash sales, credit sales, repair or service operations, character of ownership (independent or chain), whether delivery service is maintained, principal lines of goods sold. The nature

Chicago Bridge & Iron Co. Buys Reeves Plant

The Chicago Bridge & Iron Co., with manufacturing plants at Chicago, Greenville, Pa., and Bridgeburg, Ont., has acquired the plant of the Reeves Brothers Co., Birmingham. The new unit, which has a capacity of 4000 tons a month of general plate work, will be used for the manufacture of products formerly made by the Reeves Company, including storage tanks, rotary kilns and creosoting cylinders and retorts. It is planned also to manufacture elevated tanks and welded pipe at Birmingham. The newly acquired plant is readily accessible by rail and barge to the Gulf of Mexico.

E. E. Michaels, formerly assistant manager of operations of the Chicago plant of the purchasing company, has been named manager of the Birmingham plant. J. C. Vosburgh, formerly district sales manager at San Francisco, has been appointed head of a new sales organization at Birmingham.

Wallace Barnes Officers

The directors of the Wallace Barnes Co., manufacturer of springs, stampings and screw machine parts, Bristol, Conn., have organized as follows for the ensuing year:

Chairman of the board, Fuller F. Barnes; president, J. Ernest Andrew; vice-presidents, R. W. Cook, Brown Joyce, D. C. Buffum; secretary, John S. Barnes; treasurer, Harry C. Barnes.

Rapid Business Recovery in Prospect

Upturn, Barring Appearance of New Adverse Factors, Promises To
Be More Rapid than After Any Recession Since 1919

BY DR. CHARLES O. HARDY

THE most significant news items of the past month, so far as the business outlook is concerned, are those which relate to the volume of operations in the production of iron and steel and of automobiles. As has been noted in the columns of THE IRON AGE during the past few weeks, these industries have registered a startling recovery. Steel output rose from 116,000 tons a day in December to 140,000 in January. Pig iron production registered a slightly lower tonnage for January than for December, but furnaces came back into operation very rapidly toward the end of the month, so that the rate of output rose from 88,250 tons a day at the beginning to 96,750 tons at the end. Further substantial increases in the rate of steel operations are reported in the first two weeks of February.

The output of automobiles, in keeping with the reputation of this industry as a very sensitive index of business sentiment, registered a much greater recovery, the *Annalist* preliminary index number rising from 50.8 to 103.8. Moreover, the increased production rate seems to have been justified by retail buying, so far as can be judged from the scanty information yet available. The January motor shows are reported to have reflected an unexpected degree of popular interest. Illinois registrations, the only ones available at this writing, show an increase of nearly 200 per cent in sales in that State from December to January.

Sharp Rebound by Industries Hardest Hit

THE significance of these January upturns lies not only in the important place which iron and steel and automobile production have in the employment structure of the country, but especially in the fact, noted in previous articles in this series, that iron and steel and automobiles are the only major industries in which there has been any statistical basis for the gloomy forebodings which have been so widespread during the past three months. Both these industries operated during the first half of 1929 at a rate so far above normal that readjustment would have been necessary even if the stock market collapse had not occurred. Both were, therefore, in a vulnerable position when confidence received a rude shock in November.

☐ Inventories of manufactured goods were lower at end of 1929 than at the close of 1928.

☐ Hand-to-mouth buying reduces the time required to deplete inventories, making it difficult for a psychological panic to affect consumers' income seriously.

☐ The limit of curtailed buying made possible by using up inventories has probably been reached.

☐ Wholesale trade and manufacture will come back quickly if retail trade holds up.

☐ Consumer buying is threatened by reduction of employment and profits.

☐ Rapidity with which basic industries pick up holds key to maintenance of consumption.

☐ Upturn of steel and automobile output indicates that heaviest loads have been removed from shoulders of commerce.

☐ Lower short-term money of minor importance as a business stimulant.

☐ Improvement of bond market, without offsetting depression of stock market, is more significant.

Their comeback in January affords strong grounds for hope that the heaviest loads have now been taken off the shoulders of commerce.

The significant increase in steel production has been reduced, in the minds of some commentators, by the fact that the unfilled orders of the United States Steel Corporation (adjusted for seasonal variation) decreased from December to January. However, the record of the unfilled orders during the last four months of 1929 was so far out of line with the known facts of the business situation, including the

steel market situation, that it has been discredited as a business index.

Gain in Miscellaneous Freight Loadings

OTHER production data indicate little change from the levels of November and December. Declines apparently are about equal to the increases in number, when normal seasonal tendencies are allowed for, but both are in most cases small. The *Annalist's* Index of Production rose from 89.6 in December to 93.3 (preliminary figures), in January, in spite of the fact noted above that the pig iron recovery did not come in time to bring the January average as high as that for December.

In addition to the increases in steel and automobiles, a large gain was registered in cotton consumption and a small one in electric power production. The largest loss noted for the month was in bituminous coal production, which is not a good business index in the winter because it is so largely affected by weather conditions. Freight car loadings, seasonally corrected, fell off, but "miscellaneous" loadings, the most satisfactory measure of business activity among the railroad data, showed a gain.

Retail Trade Should Be Watched

THE items to be watched most closely in the next two months will be the retail trade reports. Through the past three months trade has been holding up better than most analysts expected. Wholesale trade fell off because retailers were afraid to buy in normal volume, and the production of consumers' goods was curtailed because there was a general fear of a slump in consumption. There is no evidence that there was any real basis for this fear, except with regard to automobiles, radios and a few high-priced specialties.

We have probably pretty well reached the limit of the possibility of the sort of curtailed buying that is made possible by using up inventories. Reports to the Department of Commerce indicate that inventories of manufactured goods were lower at the end of 1929 than at the close of 1928, though raw material stocks were considerably higher. Certainly they have been reduced during the first six weeks of 1930. If retail trade holds up, wholesale trade and manufacture will

Conditions Point to Three-Month Rally

BY LEWIS H. HANEY

DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

THE great question just now is: Are we seeing the beginning of a sustained recovery, or merely one of those rallies that so often interrupt a major recession?

Steel production in January rose to 93 per cent of normal, against 83 per cent in December. Hopes for a further net gain in February are encouraged by this below-normal position. Pig iron production (adjusted), however, merely moved sidewise at 97 per cent of normal. So the pig iron output continues high compared with the steel make, which is neither conducive to strong prices nor encouraging as to a sustained expansion of the industry.

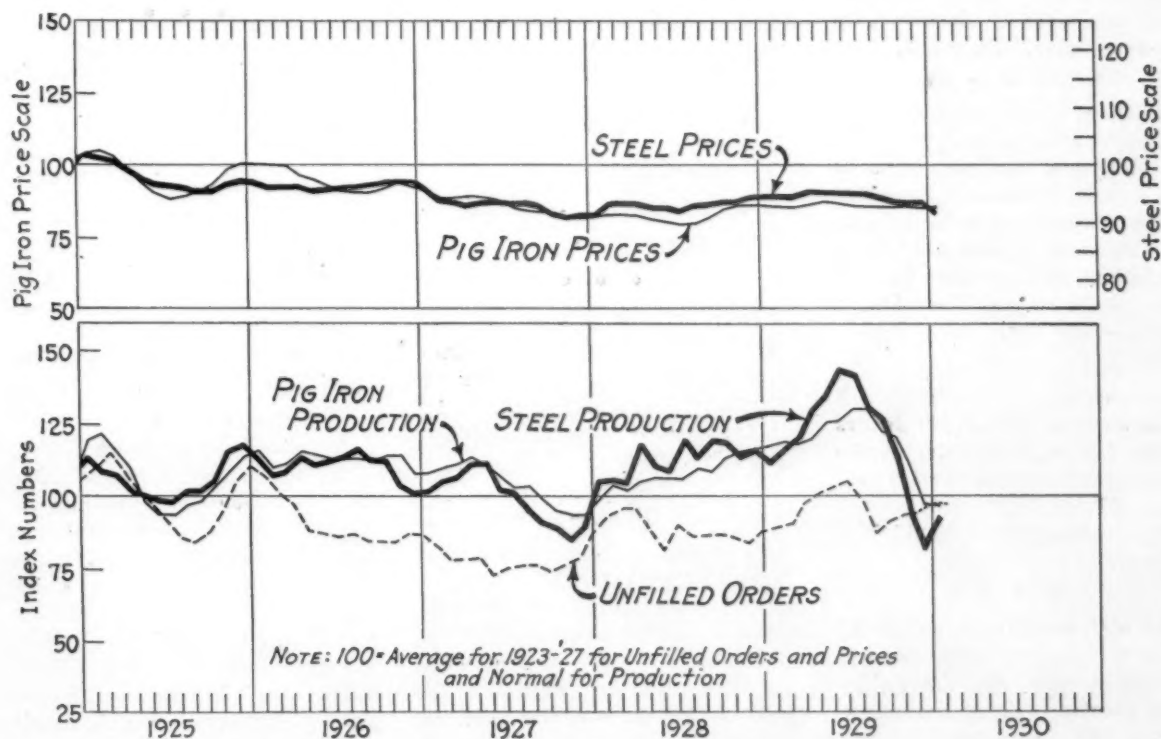
Unfilled orders showed no trend, their bare seasonal rise being less than in the two preceding Januarys. Prices of both steel and pig iron averaged lower in January than in December.

Another way of putting the main question is to ask whether the existing situation is more like January, 1924, (when there was a temporary three-month rally) or January, 1928, (when a sustained recovery began that lasted a year and a half). The answer to this question is not very clear either. The situation resembles 1924 in that steel production did not rise above normal in January and that pig iron production is large compared with the ingot output; also scrap prices rose in both periods, while in both the Bradstreet index of commodity prices was declining and relatively low compared with the average price of finished steel. It is more like January,

1928, in the volume of pig iron production and in the relatively low level of steel prices as compared with pig iron prices. On the whole, such slight indications as may be gained from such comparisons suggest a little more similarity to 1924 than to 1928.

The recent gain in steel activity will hardly be convincing as to its sustained character until steel production rises considerably higher in comparison with pig iron production than it has yet done.

The immediate question concerning the steel industry is, will consumer interest continue? It seems that the present outlook for the chief consuming industries is too mixed to allow much certainty as to an affirmative answer. Certainly there are no large shortages in any important cases—automobiles, railroad equipment, machinery, building. The general condition of commodity prices rather suggests that most key industries will have to go slow to avoid overloading their markets. The purchasing power of farmers must be limited by price developments, and statistics thus far received indicate a rather low level of employment. With bank clearings, car loadings, and factory employment all at low levels, it is difficult to see how a sustained broad expansion in the steel industry can be expected during the next few months. Nor does the condition of credit, with its apparent shortage of mortgage money and with bank loans large in comparison with the deposits, point in any other direction.



Steel and Pig Iron Output Still Below Normal, Steel the More So, and These Conditions Plus a No-Trend Showing of Unfilled Orders Do Not Suggest Strength in Prices

This Issue in Brief

Machining costs cut 80 per cent by use of quick-acting indexing fixture, which drills at one time six spoke holes in wire-wheel hub. Formerly, double-spindle press drilled one hole at a time.—Page 572.

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Welding costs can be cut, where quantity welding is done, if cylinder-handling is eliminated by piping and plant for central supply of acetylene and oxygen. Production is retarded by stopping to change cylinders, and gases may be used at uneconomical pressures.—Page 575.

* * *

Watch retail trade volume closely for advance information on trend of business conditions. If retail trade holds up, industry will quickly recover. Consumer buying, however, is threatened by curtailment of employment.—Page 588.

* * *

Savings of \$225 a day can be made in a foundry melting 25 tons daily by installing handling equipment, engineer estimates. And there are other advantages: less sand, fewer flasks, lower labor turnover.—Page 586.

* * *

To speed export sales, write in the buyer's language, quote in his currency and use his units of measure. European exporters adapt themselves more closely than we do to buyer's psychology and habits, and are more inclined than we are to give him what he wants.—Page 584.

* * *

If business is good, railroads will spend close to 800 million dollars a year for improvements. Authorized appropriations carried over from 1929 to 1930 exceeded 655 million dollars, which is high.—Page 581.

* * *

All high-speed tools should be given a high draw after quenching, metallurgist says. This gives them greater life and toughness.—Page 583.

Tool steel has 30 to 40 per cent greater wearing life if made in induction furnaces, says one maker. Heroult furnace, generally adopted for tool steel manufacture, is now being replaced to some extent by the induction furnace.—Page 583.

* * *

Fifteen molders now do work formerly done by 34, in less space. Brass casting costs cut 50 per cent by installing new equipment and rearranging plant.—Page 567.

* * *

Heat resistance and corrosion resistance are the same, says metallurgist. Ability to resist elevated temperature is simply the ability to withstand corrosive influence of hot gases. Certain ratios of nickel, chromium and silicon, primarily, will provide ultimate solution to the problem.—Page 580.

* * *

Chromium-plating of high-speed steel is unsuccessful, tool maker reports. This checks with the experience of others who have tried it, he says.—Page 583.

* * *

Large losses in welding may result from failure to use entire contents of acetylene and oxygen cylinders. Some operators discard cylinders before all the gas is used.—Page 575.

* * *

Cost of pressed part cut materially by redesign and combination of operations. Number of operations reduced from 18 to 12 in the case of wire-wheel hub.—Page 571.

* * *

To avoid overloading their markets, most key industries will have to go slowly. This is suggested, says Dr. Haney, by the general condition of commodity prices. He can see no reason to expect a broad expansion in business during the next few months.—Page 589.

You will get a manufacturing census blank if you did over \$20,000 business in 1929. Distribution census agents will call on business concerns for distribution census data and will help fill out forms, but larger concerns will receive their questionnaires by mail.—Page 587.

* * *

May save money by paying more for core sand. Some core sands take about twice as much oil as others, so a higher-priced sand may mean a lower-priced finished core.—Page 586.

* * *

Hand-to-mouth buying diminishes importance of money rates as a factor in business prosperity. Interest rates are now a minor source of business expense.—Page 587.

* * *

Overheating is source of considerable trouble in non-ferrous foundries. Even if cooled back to the proper pouring temperature, harm may be done the metal. Temperature control is of the utmost importance.—Page 586.

* * *

New elements make business forecasting a complicated affair. Economist declares that it is impossible to solve the situation on the basis of knowledge of past cycles.—Page 588.

* * *

Casting finishing costs can be cut if the same man is given always the same kind of castings. Brass foundry finds it pays to let the men in the finishing room specialize.—Page 586.

* * *

Ingenious hand truck easily picks up box of castings. One end of shop box is hopper-shaped for convenience in dumping. Two-wheeled hand truck is pushed over loaded box, which has two eyes at one end and hook at other. One end of truck is lowered and then the other. When truck handles are moved back to horizontal, box is raised 6 in. above floor.—Page 569.

come back very quickly—as seems to be the case at the moment in the automobile trade.

In the meantime, however, there has been some curtailment of employment and of profits which threatens a secondary effect on consumer buying. The seriousness of the depression depends on whether the pick-up in basic industries comes in time to keep consumption from being seriously affected by the curtailment of employment. The great advantage of hand-to-mouth buying, from the community standpoint, is that it makes it difficult for a psychological panic among business men to affect consumers' income seriously before it reaches a limit through the depletion of inventories.

New Factors Complicate Forecasting

OF course, no one can speak with any authority as to which way things will go in 1930; there are too many new elements in the situation to make it possible to solve the problem on the basis of a knowledge of past business cycles. The writer's opinion is that we are already on the upgrade in the basic lines of production and that there has been no such curtailment of consumers' income, either because of the stock market panic or because of the curtailment of employment, as to make a rapid recovery of productive activity unsafe or undesirable. There is no reason yet evident why business should not be of a normal volume in 1930—meaning by normal volume not the pace set by a few key industries in the first half of 1929, but such a level of business activity as characterized say 1925, 1926, or 1928.

Much has been said in recent days about the favorable effect of the lowered cost of short-time money and especially the lower Federal Reserve rediscount rates. Declining short-term money rates may be either a favorable or an unfavorable index, depending on the showing of other business indexes. In general they are an effect of business depression. They are part of a necessary readjustment after a period in which business has been overdone, and they facilitate the process of business recovery.

Importance of Money Rates Exaggerated

IT is easy, however, to exaggerate the importance of this item. Short-time interest rates are a minor business expense. They come into the picture either as a part of the cost of producing goods to order, in which case they have no important bearing on the volume of business that will be done, or else as a part of the cost of producing for stock and carrying inventories. With the growth of hand-to-mouth buying, and with the increased amount of working capital which is raised through stock and bond sales, their importance has diminished considerably in recent years.

Attempts to stimulate business activity through lowering interest rates are really attempts to stimulate the

accumulation of inventories on a more or less speculative basis. Consequently, they can be of only temporary importance and are desirable only when there is strong reason to believe that buyers are speculating for a fall in prices by carrying abnormally low inventories. In the present situation they may be classed as a favorable item but one of no great importance.

The improvement in the bond market is more significant, but is largely offset by the increased difficulty in financing through stock issues. It is easier than it has been for two years to finance municipal and other public enterprises and also residence construction—types of enterprise which necessarily depend upon the bond market rather than the stock market. It is more expensive, on the other hand, to finance industrial and public utility expansion than it was in 1928 or 1929.

No Lack of Long-Term Credit

IT is impossible, therefore, to draw any valid conclusion as to the net influence on the demand for basic raw materials and labor which is likely to flow from the changed money market condition. However, it is significant that the bond market has been able during the past six weeks to absorb at firm prices a very large volume of domestic bond issues, while at the same time stock prices have been

strong. There is no indication of a lack of capital for long-time investments; all that is needed is a further clearing up of the immediate business situation.

In summary, the outlook has improved during the last four weeks in the following respects: (a) a striking increase in the output of the industries which suffered most severely in the recession of the closing months of 1929; (b) the absorption during the month of a very large volume of bond issues at firm prices and without an offsetting depression of the stock market; (c) continuance of retail buying at a level which cannot be classed as high but is much better than was generally anticipated two or three months ago and shows no sign of weakening. Against these are to be set no new developments of an unfavorable character. The bad news was in early.

We cannot, of course, expect an overnight revolution. Most business indexes will certainly reflect a subnormal activity in February and perhaps in March, simply because they are too far below to get back in a single month, but the indications are that the depression forces have about spent themselves and we may reasonably expect, unless entirely new adverse factors appear, that the recovery of business over the next few months will be more rapid than after any business decline since 1919.

Institute of White Metals Organized

As the result of a preliminary meeting of custom smelters and manufacturers of white metals, held in New York, Jan. 21, a second assemblage was held at the Hotel Astor, Friday afternoon, Feb. 14, attended by smelters and manufacturers from Chicago, Indianapolis, New York, Boston, Buffalo, Newark, Philadelphia, Pittsburgh, Norfolk, Va., and Toronto, Canada. At this meeting a decision was reached which resulted in the organization of what is to be known as the Institute of White Metals.

Before the formal decision was reached, Benjamin Schwartz, director general of the Institute of Scrap Iron and Steel, Inc., New York, in an effective address outlined a program of activities for the proposed institute covering the fields of cooperation, education in costs, establishment of trade practices, public relations, standardization and certification of materials, credit and arbitration.

A report of the organization committee consisting of I. Davis, Long Island City, N. Y.; Jerry Katz, New York; E. C. Miller, New York; L. Muscat, Brooklyn; J. H. Paterson, Newark, N. J.; S. Siegel, New York, and Walter Schoenbach, Indianapolis, presented a set of eight recommendations for the establishment of the institute. Before the close of the meeting, as a result of the recommendation of a nominating committee, the following temporary officers were elected:

L. Muscat, United American Metals

Corporation, Brooklyn, chairman; Walter Schoenbach, American Lead Co., Indianapolis, secretary, and Jerry Katz, American Metal Co., New York, treasurer.

It was decided to call a meeting of smelters and manufacturers of white metals in Chicago, March 7, for the purpose of enrolling companies in the mid-western parts of the country.

Scrap Institute Expels Member; Code Violated

The Institute of Scrap Iron and Steel, New York, announces that it has expelled a member for violation of rule No. 9 of its code of business practices, involving overbilling of shipments. This action was taken at a meeting of the executive committee in New York last week and is in line with the announced intention of the scrap institute to discipline the scrap trade for unfair business practices. At a previous meeting of the institute's trade relations committee complaints had been lodged against a member for alleged overbilling of shipments.

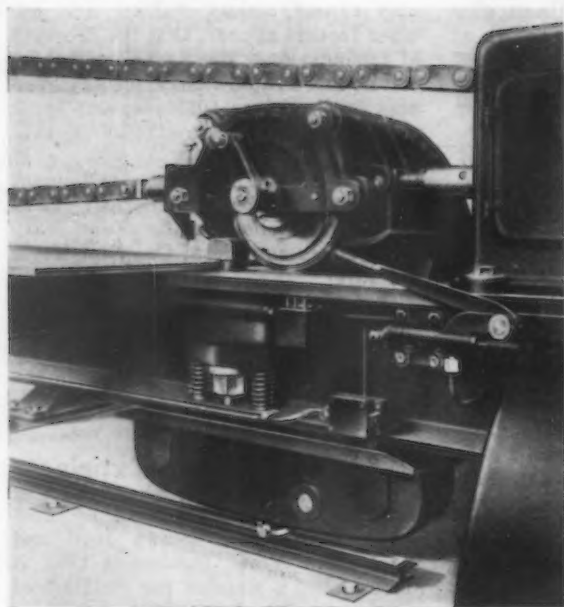
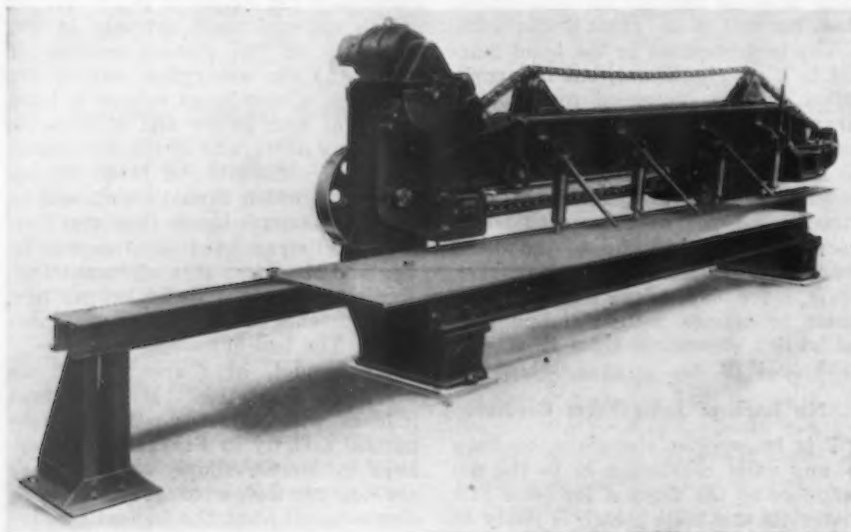
Coming Meetings of Iron and Steel Institute

The annual meeting of the Iron and Steel Institute (British) is scheduled for May 1 and 2 at the House of the Institution of Civil Engineers, London. The autumn meeting of the institute is scheduled for Prague, Czechoslovakia, Sept. 15 to 20.

Plate Slitting, Trimming and Beveling Shears

A LINE of plate shears employing a moving upper rotary knife and a stationary lower knife, arranged as shown in the illustration, is being

The model SB is throatless and the length of the lower knife is equal to the maximum length of cut. The model DB has throats in the housings;



THE D B Model Shear Above Shows Chain Drive Which Moves the Rotary Knife, and Open Frame Construction Permitting Long Plates to Be Cut. Close-up at left of knife carrier on S B model shear. Note depth adjustment to compensate for grinding of knife

marketed by United Machine Tool Corporation, 75 West Street, New York. Sixteen sizes of the new machines are offered. The smallest will shear a $\frac{1}{8}$ -in. plate 100 in. long in 5 sec. and the largest a $1\frac{3}{16}$ -in. plate 50 ft. long in 90 sec.

Beveling and scarfing can be done with the plate held in the same position as for square cutting. The regular knife and holder are replaced by a special beveling blade and guide which holds the cutting edge at the desired angle to the work. Knives for 18 and 30 deg. angles are procurable for all models. Other blades to cut any angle up to 40 deg. can be procured on special order. The chain drive which moves the rotary upper knife carrier across the work can be seen in the illustration.

Three models of these shears, which are designated as the SN, are built.

any length of plate can be cut and any width up to the limit of the throat depth. For work that is longer than the machine a feeding table can be supplied. The third model is the SB. These machines are the heaviest and are intended for trimming, being especially adapted for edging long, heavy plates. They have a throat on the knife carriage, but none in the housings. The knife carrier is in the shape of a caliper, the lower face bearing against the under side of the stationary knife. The width of cut is limited by the depth of throat of the knife carriage, which can be made to suit requirements.

The larger machines are provided with pneumatic hold-downs. The rotary knife carriage, driven by motor through heavy block chain, can be stopped and started at any point in its travel, and is disengaged automatically

at the end of its travel in either direction. Push-button control is standard on the heavier machines, but is only provided on order on the smaller shears. The rotary knife is mounted on an eccentric shaft and can be reground conveniently. The lower knife is in six or more sections, according to the length of the machine.

High-Speed Pneumatic Chipping Hammers

A NEW line of high-speed pneumatic chipping hammers has been developed by Ingersoll-Rand Co., 11 Broadway, New York. The use of a plate valve of the flapper type results in several important advantages. Being a thin beveled plate, the flapper valve permits the hammers to be made short in overall length and also light in weight. The valve flaps down on its seat in a valve box to close the air ports, and rises to open them.

This action gives quick and full opening and closing of the air ports—resulting in exceptional power and speed. There is no sliding movement to the valve and, consequently, it has a smooth and positive action. This accounts for easy holding and sensitive throttling. Furthermore, the valve does not wear, but its fit on the valve box improves with use.

Another feature is the throttle valve, of a combination piston and poppet type which gives very fine graduation of port opening and remains tight for a long period.

Open-type handles are standard on these chippers. The handles screw on the barrels and are securely locked in place by a new type of pinch bolt arrangement. The exhaust is through the side of the barrel and can be deflected in any desired direction by means of an adjustable exhaust deflector.

Five sizes are furnished: size 000, $\frac{3}{4}$ -in. stroke; size 100, 1-in. stroke; size 200, 2-in. stroke; size 300, 3-in. stroke; and size 400, 4-in. stroke. These five sizes meet the conditions encountered in the various classes of chipping and calking work. It is



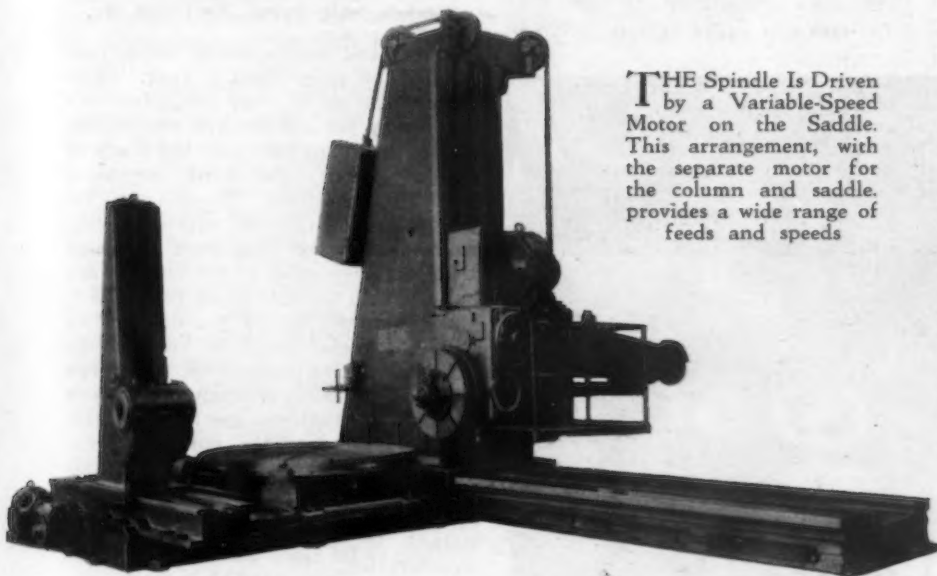
FLAPPER Type Air Valve Reduces Size and Weight of This New High-Speed Chipping Hammer

claimed these new hammers will turn out more work with less fatigue to the operator and that their high power gives both fast and heavy cutting. Their high speed makes possible an extremely smooth cut.

New 7-In. Boring, Drilling and Milling Machine

USE of a variable-speed motor, mounted on the saddle, solely for driving the spindle, is a feature by the Betts 7-in. floor-type horizontal boring, drilling and milling machine illustrated, which is built by the Con-

For boring and drilling eight feeds are obtainable, while for milling a wide range of feeds is available through the variable-speed motor and supplementary mechanical changes. The machine is capable of cutting



THE Spindle Is Driven by a Variable-Speed Motor on the Saddle. This arrangement, with the separate motor for the column and saddle, provides a wide range of feeds and speeds

solidated Machine Tool Corporation of America, Rochester, N. Y.

A separate variable-speed motor provides milling feed and power rapid traverse for the saddle and column, while a third motor is employed for moving the circular table toward and away from the column runway. This arrangement of separate motors for the column and the saddle and for the spindle is intended to provide a wide range of speed and feed without complicated gearing.

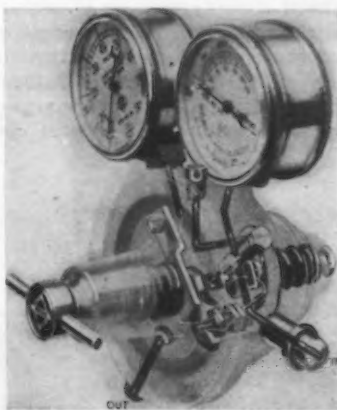
In addition to the large floor plate of heavy box construction, the machine may be equipped with a circular table, as shown in illustration. The table is driven by individual motor through worm and worm-wheel. The steadyrest is mounted on a separate carriage which can be bolted to the floor plate or be used on the circular-table runway. It has rapid hand adjustment on the runway. The boring bar bearing is adjustable vertically on the column by hand.

The high-carbon hammered steel spindle of the machine is supported in a bronze-bushed cast iron sleeve. For slow speeds it is driven through a steel face-plate gear, and a small motor mounted at the end of the saddle provides for power rapid traverse. The column has a graduated scale for accurate adjustment, also taper shoes for taking up wear. The standard Betts type narrow guide is provided for the saddle, which has a large bearing surface on the column. The motor for milling feed and power travel of column and saddle is located on a shelf at the base of the column. The saddle has a vertical travel of 10 ft. and is provided with a platform, as shown, to facilitate operation of the various controls. Lubrication of the machine is by means of the Farval one-shot centralized system.

threads of four different leads. It is built in several sizes, the smallest of which has a 5½-in. diameter spindle.

Duo-Control Regulator for Welding and Cutting Gases

A DUO-CONTROL regulator intended to provide the even pressure and volume of gas necessary to best results in gas welding and cutting operations has been brought out



The Second Control Permits Maintaining Any Gas Pressure Desired

by the Weldit Acetylene Co., 640 Bagley Avenue, Detroit.

The device combines two regulators in one. In the first the original tank pressure, which averages about 2000 lb., is reduced to a working pressure of 175 to 200 lb., while in the second, which is composed of extremely flexible elements, the pressure is further reduced to where it gives a constant even flow of gas. The extreme sensitivity of the second control is said to permit any desired pressure to be held constant.

The housing for the regulator is made from forged bronze, and the various elements in each control are of ample strength to withstand the pressures to which they are subjected. The regulator is provided with screens to prevent entrance of foreign matter, and has a dual system of safety devices to prevent damage to the various parts of the device from excessive pressure.

Selectors Aid in Use of Wire Gages

TWO wire gage selectors, Nos. 698A and 698B, designed to simplify the gaging of wire, have been put out by the Brown & Sharpe Mfg. Co. of Providence, R. I. As these selectors cover up the slots in the wire gage adjacent to the one being used, the one slot for any particular size is made accessible for fast and easy gaging. Thus is simplified the gaging of a large number of pieces of wire.



Selectors are easily and quickly attached to wire gages. The spring fingers of the selector arm snap around the stud on the disk, holding the selector in place on the gage. If desired, the selector is as easily removed. There are no screws or nuts to become lost.

No. 698A is for use on Brown & Sharpe wire gages Nos. 688 (5 to 36) and 690 (6 to 36); No. 698B is for use on wire gages Nos. 688 (0 to 36), 690 (1 to 36), 692 and 694.

Self-Lubricating Bearing

A NEW self-lubricating bronze bearing designed to provide uniform area of bearing surface on the pressure line and assure effective distribution of lubricating compound has been announced by the Johnson Bronze Co., New Castle, Pa.

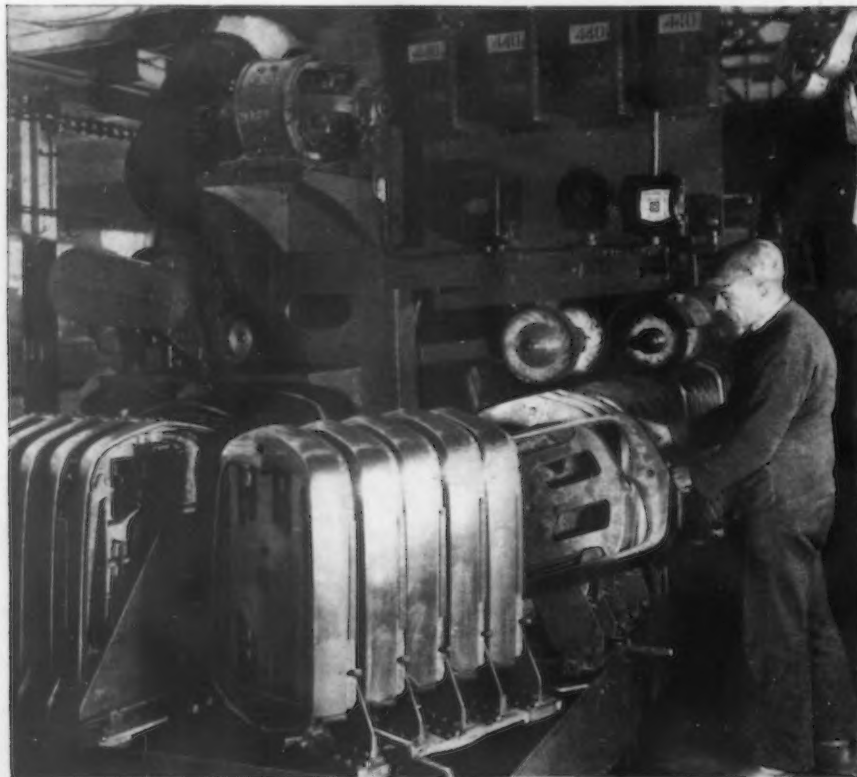
The improved results are obtained by a new method of effecting indentations in the metal and by placing them at an angle of 30 deg., the indentations serving as a receptacle for the lubricating compound. These bearings are suitable for use on machinery subject to intermittent or periodical operation, such as brake levers, clutch levers, shock absorbers, slow running journals, rocker arms, sliding door rollers and the like.

Rustless Steel Resists Severe Tests

Why Ford Decided to Use Chrome-Nickel Alloy—It Withstands Salt Spray, Mine Water and Other Tests

RUSTLESS steel, which the Ford Motor Co. recently introduced in exposed metal parts of the new Fords, is an innovation in the automobile

upon the use of rustless steel, generally known as the chrome-nickel alloy steel containing 18 per cent chromium and 8 per cent nickel with



Radiator Shells of Rustless Steel Are Polished to a High Brilliance Before Assembling. They require no polishing later

industry. Resistant to rust, tarnish or corrosion, a damp rag is all that is necessary to restore its original brilliance.

When the Ford Motor Co. decided

low carbon content, there was no one manufacturer equipped to produce enough of it. Therefore, to insure a constant and adequate supply arrangements were made with several com-

panies to manufacture the metal according to the standard prescribed in Ford specifications. Before adopting the alloy it was subjected to many severe tests by the United States Bureau of Mines, by metallurgical and other scientific institutions and by the Ford company.

Stands Salt Spray Test 400 Hr.

The Ford experiments were conducted for more than a year. Samples of the metal were subjected to a salt spray for 100 hr., the equivalent, according to engineers, of ten years of service under the most corrosive weather conditions. There was no suggestion of tarnish, rust or corrosion. Following this most rigorous trial, other samples of the metal were subjected to the salt spray for 400 hr., the equivalent of 40 yr. of service. Still the metal could be restored to brilliance with a damp cloth. For more than a year, also, company cars were fitted with rustless steel parts and were operated under normal conditions. Periodically, experts from the company's research laboratories inspected the parts and found them resistant to wear, rust, tarnish or discoloration.

In a test made by the United States Bureau of Mines, a sheet of the metal, 8 x 12 in. and 0.07 in. thick, was immersed in highly corrosive mine water in Windburne Field, a strong corrosive water in central Pennsylvania. Miners in this field have left their shovels in working places for a week or ten days and upon their return have found nothing left, it is said, but the handles. After six months' total immersion the rustless steel sheet was found to be of the same weight as when first placed in the corrosive water.

In the improved Fords, rustless steel has been utilized in the new cowl strip, the head lamps, radiator shell, rear lamp, and the radiator, hub and gas tank caps.

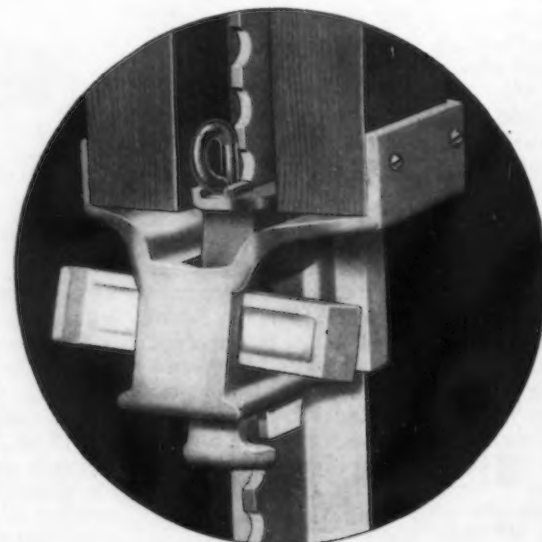
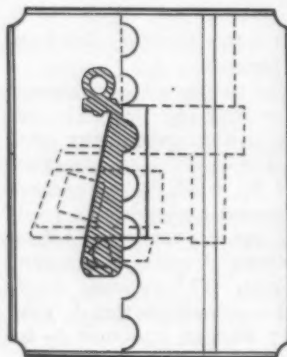
Adjustable Shore with Positive Safety Lock

AN adjustable shore featuring a unique jacking device, designed to prevent slippage or settling under load, has been placed on the market by the Symons Clamp & Mfg. Co., 4249 Diversey Avenue, Chicago.

Adjustment is made by a ratchet arrangement similar to that used in an automobile jack, but there is provided a secondary wedge adjustment taking care of the 1-in. ratchet spacing.

The lower part of the shore consists of a T-bar and the upper member consists of two pieces of 2 x 4's bolted together with a No. 14 gage channel rabbeted into them as reinforcement, and also serving as a slide for the T-bar or bottom member. The jacking device will easily lift a load of 6000 or 7000 lb., this feature being valuable in case of settlement by reason of weather conditions or other causes.

The construction of the shore being reinforced by steel channel gives it a safe working load of 10,000 lb. The illustration shows a close-up of the ratchet device with secondary adjustment.



Close-Up of Lock and Wedge Adjustment of the Symons Safety Shore

Research Creates Employment

Offsets the "Technological Unemployment" Which It Produces by New Jobs, Both in Factories and Outside

CHICAGO, Feb. 18.—Industrial research is creating new jobs, according to a statement made before today's meeting of the Illinois Manufacturers' Association by T. A. Boyd of the research laboratories of the General Motors Corporation. He went on to say:

"In spite of the phenomenal development of labor-saving machinery and short-cut processes, the number of persons employed in American manufacturing industries has not decreased by comparison with the beginning of this century. On an equivalent population basis there has been, instead, a 20 per cent increase in factory workers since 1900. Research, which is here considered as comprising all forms of experimentation and of searching for new knowledge, is the reason for this increase. It has come about simply because the job-creating effect of research and invention has more than offset the destruction of factory jobs.

"Outside the factory, also, research has created a multitude of new jobs. Because of the automobile, the telephone, the radio and like products of research, the number employed in transportation and communication has grown four-fold since 1900, until about one out of every five workers now has a job in this branch of industry. The greater prosperity, the larger leisure and the improved appreciation of the need for knowledge, all of which have sprung directly or indirectly from research, have also created millions of new jobs for people to fill.

"Altogether, it appears that research has created a new job for each old one it has destroyed, and this it has done without any of the effort having been specifically directed toward the creation of jobs. To the cloud of technological unemployment, which by some observers has been painted so black of late, there is at any rate a bright, silver lining in the form of technological employment. The cure for the one evil of research, which is its job-destroying effect, seems to lie in still more research—in research that is definitely of the job-creating kind."

Large Accident Prevention Meeting Planned

More than 20 organizations are co-operating in the Greater New York Safety Conference to be held Wednesday, Feb. 26, at the Hotel Pennsylvania, New York. These organizations include the metropolitan chapter of the American Society of Safety Engineers (engineering section, National Safety Council), the American Society of Mechanical Engineers, American Institute of Electrical Engineers, American Institute of Min-

ing and Metallurgical Engineers, American Welding Society, National Metal Trades Association, Structural Steel Board of Trade and the New York State Department of Labor.

Accidents due to handling of materials and falls of persons and objects will be discussed at a general session following the morning and luncheon meetings. Sessions devoted to commercial vehicles and construction hazards will be held simultaneously with the general session.

An address on "Illumination in Relation to Accident Prevention," by D. W. Atwater, illuminating engineer, is planned for the evening session, to be held at the Westinghouse Lighting Institute, Grand Central Palace, New York. The meeting will be followed by an inspection of the institute's exhibits and demonstration and special lectures on the various types of lighting. A. S. Regula, 21 East Fortieth Street, New York, is chairman of the attendance committee.

Metric System Would Be Expensive

William E. Bullock, secretary, American Institute of Weights and Measures, New York, estimates that it will cost manufacturers \$30,000,000, spread over 10 years, to substitute metric units for our customary units. Equivalent to \$20,000 a year for each of 150,000 plants, this cost will be passed on to the public.

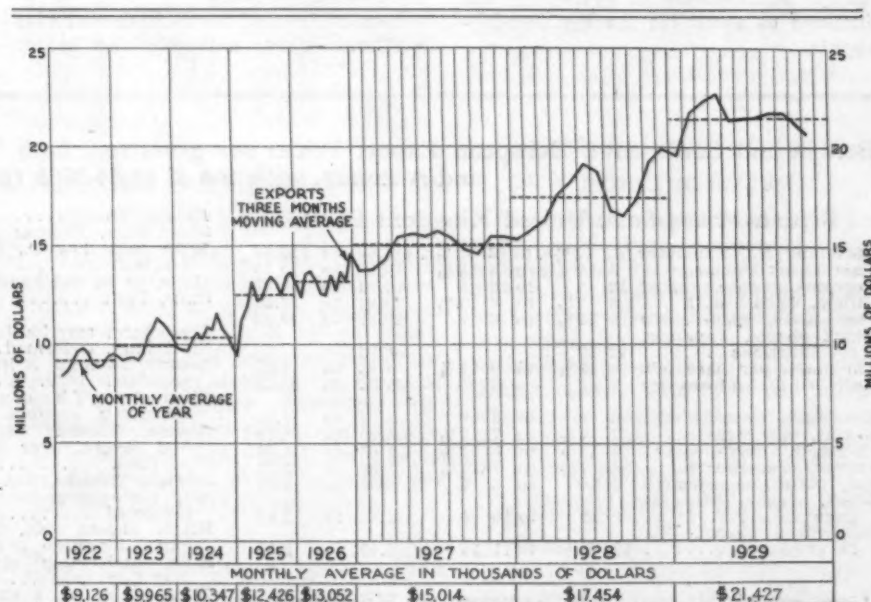
Added is an item of \$230 (average) for each of the 42,000,000 workers in

the country—an expense the workmen will have to bear themselves, to buy new metric tools. Then, for the 10,000,000 public school children, who must have new text books on the metric basis, the average cost is \$10 per child. Several million dollars will have to be spent by storekeepers for new weighing scales, all gasoline stations will require new pumps, and so on.

Lastly must be added the cost of enforcement of the new units and standards by the Government. It is estimated that the Bureau of Standards, into whose charge enforcement is expected to fall, will require to recruit and maintain a staff of 10,000 enforcement officers.

Leave for Russia to Build \$40,000,000 Plant

C. W. Wolfe, assistant vice-president in charge of foreign operations, and F. A. Coleman, foundry expert, of the Austin Co., Cleveland, sailed Feb. 15 from New York for Russia to supervise preliminary work on the \$40,000,000 automobile plant and industrial city the Austin Co. is designing and will build for the Soviet government at Nizhni Novgorod. Mr. Wolfe will have charge of operations until the arrival, about April 1, of H. F. Miter, vice-president of the company's foreign department, with about 80 Austin engineers and technical experts. Mr. Wolfe and Mr. Coleman will supervise a force of Russian labor in getting material and equipment on the ground preliminary to commencing actual construction. Quarters are being constructed for the Austin organization and 8000 Russian workers, who will be employed when the construction is in full swing.



UNITED STATES exports of industrial machinery for eight years are shown in the chart. To avoid the heavy fluctuations of the month-by-month record, the curve has been plotted on a three-month moving average. Monthly exports in 1929 were more than double those of 1922, 1923 or 1924. Each year registered a gain over any preceding

European Markets Await Developments

Marking Time and Watching Cartels—Trying to Get United States into World-wide Agreement on Production—Japan Plans New Rail Mill

(By Cable)

LONDON, ENGLAND, Feb. 17.

CLEVELAND pig iron is quiet and furnace stocks are accumulating, so that a reduction of output is not improbable. The Scottish Light Castings Association is inquiring for 10,000 tons of foundry iron, which may go to Midlands furnaces, although Cleveland makers will probably make a special bid for the tonnage.

Hematite demand has increased slightly with sales to Italy, but stocks are heavy and makers are in need of orders.

Finished iron and steel is dull, especially for export. Some works are practically closed, while others are well engaged for the present. Domestic demand for steel has been affected by slowing down of shipyard specifications.

British exports of pig iron in January were 37,000 tons, of which the United States was sent 2600 tons. Total iron and steel exports were 352,000 tons.

Tin plate is quiet and the range of prices is wider, as some makers using foreign steel are accepting down to 18s. 3d. (\$4.44) per base box, f.o.b. works port, for straight specifications, while others, using Welsh steel and possessing good order books, are obtaining 18s. 9d. (\$4.56) per base box. There is a moderate volume of inquiry, but consumers, generally, are inclined to await tin market developments.

Galvanized sheets are quiet and prices easier, but it is believed that the lowest level of the market has been reached, as foreign steel is stiffening. Black sheets are inactive, with almost no Far Eastern business.

The Wigan Coal & Iron Co. and Pearson & Knowles, Ltd., are reported to have reached a provisional agreement for a merger of interests. Swedish works have secured a contract for 1200 tons of stainless steel plates for the Assouan Dam in Egypt at a total price of about £120,000 (\$584,000).

The Continental market is quiet, with consumers awaiting further car-

tel developments. The cartel has agreed to place merchants in three classifications, with allowances of 6d. (12c.), 1s. (24c.) and 2s. (48c.) per ton, respectively.

The International Steel Cartel has advanced prices by 2s. (48c.) on semi-finished products, 2s. 6d. (60c.) on merchant bars and angles, and 4s. (97c.) on plates ¼-in. and heavier. The cartel is now reported to have made overtures to the United States, with view to forming a world combination of producers to prevent overproduction.

The German pig iron output in January was 1,092,000 metric tons.

British Export Trade Quiet

Mills Operating on Domestic Orders and Old Export Contracts—Pig Iron Inactive But Output Is Restricted

LONDON, ENGLAND, Feb. 1.—The only important developments in the iron and steel markets here are the decision of the International Steel Cartel to establish sales organizations and its continued effort to maintain prices at a higher level. This has reduced business in the United Kingdom to a minimum and caused dullness in Continental markets.

Export demand for British material continues poor, not only for heavy

steel products, but for lighter materials also. Galvanized sheet producers have reduced prices to the lowest level since the war in an unsuccessful effort to stimulate buying by Indian and other large users. Some Colonial Government orders have been booked by British mills, but the ordinary merchant trade in steel is exceedingly quiet. Nevertheless, mills are maintaining fair rates of operation on domestic orders and contracts secured

British and Continental European Export Prices per gross ton, f.o.b. United Kingdom Ports, Hamburg and Antwerp, with the £ at \$4.8665 (par)

British Prices f.o.b. United Kingdom Ports

Cleveland No. 3 foundry	£3 12½s. to £3 13½s.	\$17.64 to \$17.88
East Coast hematite...	3 18 to 3 18½	18.98 to 19.10
Ferromanganese, export	12 5 to 12 10	59.61 to 60.83
Billets, open-hearth...	6 2½ to 6 12½	29.81 to 32.24
Sheet bars, open-hearth	5 17½ to 6 5	28.59 to 30.42
Black sheets, Japanese specifications	12 10 to 0 18½	60.84 to 4.43
Tin plate, per base box	0 18½ to 0 18½	4.43 to 4.55
Rails, 60 lb. and heavier	7 15 to 8 15	37.72 to 42.58
Cents a Lb.		
Steel bars, open-hearth.	8 0 to 8 10	1.74 to 1.85
Beams, open-hearth...	7 7½ to 7 17½	1.60 to 1.71
Channels, open-hearth...	7 12½ to 8 12½	1.66 to 1.87
Angles, open-hearth...	7 7½ to 7 17½	1.60 to 1.71
Ship plates, open-hearth	7 15 to 8 5	1.68 to 1.79
Black sheets, No. 24 gage	9 15 to 10 0	2.12 to 2.17
Galvanized sheets, No. 24 gage	11 10 to 11 15	2.49 to 2.55

Continental Prices, f.o.b. Antwerp or Hamburg

Foundry iron, 2.50 to 3.00 per cent sil., 0.50 to 0.90 per cent phos.	£3 6s. to £3 10½s.	\$16.06 to \$17.15
Foundry iron, 2.50 to 3.00 per cent sil., 1.00 per cent and more phos.	3 4 to 3 5	15.58 to 15.82

Billets, Thomas.....	4 13 to 4 14	22.63 to 22.87
Sheet bars, Thomas....	4 13 to 4 15	22.63 to 23.12
Wire rods, low C., No. 5 B.W.G.....	6 2 to 6 4	29.69 to 30.19
Rails, 60 lb. and heavier	6 8½ to 6 10*	31.27 to 31.63
Rails, light	6 0	29.20
Cents a Lb.		
Steel bars, merchant...	5 7½	1.18
Steel bars, deformed...	5 6½	1.17
Beams, Thomas, British standard	5 0 to 5 4	1.10 to 1.15
Channels, Thomas, American sections...	5 12 to 5 14	1.24 to 1.26
Angles, Thomas, 4-in. and larger, over ¾-in. thick	5 6	1.17
Angles, Thomas, 3-in. and larger, over ¾-in. thick	5 7½	1.18
Ship plates open-hearth inspected	7 3 to 7 5	1.56 to 1.60
Black sheets, No. 31 gage, Japanese	12 2 to 12 3	2.67 to 2.68
Hoop and strip steel over 6-in. base.....	5 11½ to 5 12½	1.23 to 1.24
Wire, plain, No. 8 gage	7 0	1.55
Wire, galvanized, No. 8 gage	8 7½	1.85
Wire, barbed, 4-pt. No. 12 B.W.G.....	11 0	2.43
Wire nails, base.....	7 2½	\$1.57 a keg
Wire nails, assortments 1 to 6-in. keg.....	10 6½	2.28

*Open-hearth steel, 8s. (\$1.95) a ton extra.

late last fall, on which specifications are just beginning to be received. Unless new contracts are made soon, however, lack of tonnage on books will be serious.

Pig iron is generally quiet, as reduced fuel costs have caused consumers to expect lower prices. Makers claim, however, that they are unable to pass on this saving. The restricted output of Cleveland furnaces is being fully absorbed and stocks are negligible, so that producers are not altogether in an unsound position.

Rationalization is making further progress. The latest combination, which is considered more as a working agreement than a merger, is between William Beardmore & Co. and David Colville & Sons in Scotland. The latter is taking over all the Beardmore plate, shape and billet business. The first result of suspending operation of the Beardmore mills at the Parkhead works and transferring their production to the plant of David Colville & Sons has been to add another 600 men to the list of Britain's unemployed.

Japan to Make Tie Plates; Plans New Rail Mill

YOKOHAMA, JAPAN, Jan. 20.—The Seitetsu-Jo (Imperial Steel Works) is understood to be ready to begin production of tie plates for 50-kg. (100-lb.) rails in March and for 37-kg. (75-lb.) rails in April. The new capacity is expected to reduce imports of foreign tie plates considerably, and is in furtherance of the aim of the Seitetsu-Jo eventually to furnish all Japanese steel requirements and even have a surplus available for export. Plans are now being made for a new rail mill, with an annual capacity of 300,000 tons, which will replace the present plant. Construction of the mill is expected to begin in the fiscal year 1931-1932.

In the fiscal year beginning April 1, the Government works production program calls for a total of 1,020,000 metric tons of steel products, compared with 938,000 metric tons, produced in the current fiscal year.

American Rolling Mill Co. to Manage British Plant

The American Rolling Mill Co. has arranged with John Summers & Sons Co., Ltd., to manage and operate for Armco sheet production the specialty sheet division of the Summers company plant at Shotton, Chester, England. The Summers company is one of the largest producers of sheet steel outside the United States and has been a licensee of the American Rolling Mill Co. for some years, agreements for the manufacture of Armco ingot iron having been made prior to the war.

The specialty sheet division of the Shotton Works was only recently built and is of modern design being installed under a working arrangement between Summers & Sons Co. and the American Rolling Mill Co. It

is intended to produce high-finish sheets to serve the growing automobile industry of Great Britain on a basis comparable with that existing in the United States. The working organization will leave Middletown, Ohio, before March 1.

Russia to Buy 50,000 Tons of Steel Pipe

HAMBURG, GERMANY, Feb. 3.—A call for bids on 45,000 to 50,000 tons of steel pipe is being prepared by the U. S. S. R. for the construction of a second pipe line in the Caucasus, from Batoum to Baku. The first line was supplied by the German Mannesmann Tube Co., but keen competition is expected among European companies to secure this second contract. Late this year the Russian Government is expected to inquire for about 30,000 tons of pipe for the first section of a line from Baku to Moscow.

January British Iron and Steel Output

LONDON, Feb. 15 (*By Cable*).—Pig iron output in January was 650,000 gross tons and that of steel ingots and castings was 771,100 tons. Pig iron production was larger than the 1929 monthly average of 631,600 tons but the steel output was less than last year's average of 800,600 tons per month.

Comparison of the January output with other periods is given in the following table:

	Pig Iron Gross Tons	Steel Ingots and Castings, Gross Tons
1913—Av. monthly..	855,000	638,600
1920—Av. monthly..	669,500	755,600
1922—Av. monthly..	408,500	490,100
1923—Av. monthly..	620,000	706,800
1924—Av. monthly..	609,900	685,100
1925—Av. monthly..	519,700	616,400
1926—Av. monthly..	203,500	296,700
1927—Av. monthly..	607,800	758,200
1928—Av. monthly..	550,900	710,400
1929—Av. monthly..	631,600	800,600
1930—January	650,000	771,100

Austrian Beryllium Plant to Operate in April

VIENNA, AUSTRIA, Feb. 1.—Operation of a new beryllium plant, now being erected at Graz, is expected to begin in April. Built by an American, German and Austrian group, the plant will operate under the name of Dr. Kurt Steidler Beryllium Co. With plentiful and rich ores available, it is believed that beryllium can be made at a price of 600 to 700m. per kg. (\$64.90 to \$75.70 per lb.)

Newfoundland Hematite Ore Production in 1929

WASHINGTON, Feb. 18.—Production of hematite iron ore from the mines of Bell Island, Newfoundland, totaled 1,516,999 gross tons in 1929 compared with 1,547,395 tons in 1928, according to a report received by the Department of Commerce. The largest ex-

ports were 750,000 tons to Germany, 700,000 tons to Sydney, N. S., and 76,000 tons to the United States. New equipment is being installed at one mine, and it is expected that production will be increased in 1930 to more than 2,000,000 tons.

Anshan Works to Blow in New Furnace

WASHINGTON, Feb. 14.—The Anshan Iron & Steel Works, Mukden, Manchuria, has completed a new 500-ton blast furnace which it expects to blow in this month, according to a cablegram received by the Department of Commerce from Mukden. In addition to the new furnace, the company has two 300-ton furnaces at Anshan.

Employers Subject to Fines for Lack of Safety Devices

HAMBURG, GERMANY, Feb. 3.—An important decision on safety in industrial establishments has been rendered by the German Supreme Court of Appeals. Under this decision, if an employer has insufficient protective equipment, such as safety devices on machinery, he is not only liable for any damage suffered by his employees, but is also subject to a fine and possible imprisonment.

Record in Automotive Exports in 1929

Exports of automotive products from the United States and Canada reached a new record in 1929, totaling \$722,660,331 in wholesale value, an increase of more than \$60,000,000 over shipments in 1928. This showing was made in spite of considerably lower prices on many products, such as passenger cars, trucks, tires and batteries, says *Automotive Industries*.

Japanese Sheet Imports Small in 1929

YOKOHAMA, JAPAN, Jan. 18.—Imports of black steel sheets, 0.7 mm. and thinner, during 1929 were only 82,122 tons, the smallest total in several years. December arrivals were also small, totaling only 2790 tons, of which 1986 tons came from the United Kingdom, 436 tons from the United States, 367 tons from Germany and 1 ton from elsewhere.

Stops Scrap Exports

WASHINGTON, Feb. 18.—In an effort to aid in developing an iron and steel manufacturing industry within the country, the President of Argentina on Dec. 10 issued a decree prohibiting the exportation of scrap iron and steel, according to a report received from Buenos Aires by the Department of Commerce. Exports of scrap from Argentina average approximately 40,000 metric tons annually.

A. I. FINDLEY
Editor

THE IRON AGE

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Managing Editor

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Steadiness in Steel

HOPEFULNESS is scarcely a virtue if it is predicated upon too low an appraisal of existing conditions. It is easy enough to predict better things if a poor enough picture is painted of the present. The steel trade will do well not to expect too much activity to be added to the present volume, for steel is not doing at all badly at present.

One great danger is that of assuming a long time for recovery from the effects of the stock market collapse of nearly four months ago. It would not take a great many months of so-called "recovery" at only a moderate rate month by month to carry steel to a higher peak than ever. Taking account of the favorable influence of low money rates since developed, there is ground for arguing that, on the whole, recovery from that particular occurrence is complete. Of course account would still have to be taken of other matters, particularly such possible excesses as may have been committed long before the stock market collapse.

Steel production had a special slump in December and a special rise during January. Since the first of February there has been a slow increase, at much the same rate as has been followed during the first quarter of other years. While the present rate is much below that at this date last year, it approximates rather closely the February rate of other years and one does not have to go back many years to find a lower rate.

Certainly steel production is not at a particularly low rate when it is only about 20 per cent under the record high, last May, a rate regarded as almost phenomenal. In November, 1927, production was 28 per cent below the preceding high, and in July, 1924, it was 55 per cent under the previous high. That was a slump of really impressive proportions.

It is perfectly logical and proper to expect further improvement in steel, taken as a whole, but it is out of the question to expect improvement all along the line for the simple reason that in several outlets steel is now doing all that can possibly be counted upon, as to rails, structural fabricating, freight cars and agricultural implements. Probabilities of improvement are confined to the remainder of the field, which, however, comprises much more than one-half the sum total of average steel distribution.

In the matter of prices the steel market has done quite well in recent weeks, particularly so by contrast with the manner in which prices had previously been slipping. Apparently it required some object lessons to convince sellers of the necessity of standing their ground. The ease with which prices yielded was one impressive point, dictating caution, while cost sheets

with their sharp increases due to smaller tonnage has been another.

All told, steel is not in bad shape at all, and the trade should not allow expectations of further improvement to minimize appraisal of the present strength.

Abuses in Convention Entertainment

ON several occasions THE IRON AGE has referred to evils which have grown up in connection with the entertainment exhibitors and other attendants at business conventions have furnished to their customers and prospects. The officers of the American Foundrymen's Association have taken a decided stand on this matter and have creditably headed one of the movements that seeks to do away with some objectionable sideboard practices which have grown worse in the past two years. In our issue of Feb. 6 reference was made to the request of the American Oil Burner Association that exhibitors and others attending its annual show at Chicago in April next, cooperate in doing away with "lavish, unwarranted and wholesale" entertainment. On reading of this action the head of an important manufacturing company in Pennsylvania wrote us commending it and then added:

Because I feel that this movement is a good one, I am writing you in the hope that you will endorse it and editorially speak in condemnation of existing conditions. Personally I can say that after our men return from a convention I feel that they are, for a time at least, debilitated physically and mentally, and that their moral standard has dropped just a shade lower. I am speaking now of men whose daily life and deportment otherwise during the year is above reproach.

As we have indicated before, not a few manufacturers in the metal-working industry have said openly that unless they could be assured against a repetition of some of these unpleasant experiences they might be counted out of any plans for future exhibits of certain associations. The tragic happening at one convention within the past eighteen months presumably had much to do with these decisions and with the commendable action of various association directorates. We cannot doubt that the movement will spread. It is a case of a small minority bringing discredit upon an organization by practices which an overwhelming majority condemn and which even the principals of the small number of offenders would not sanction. Selling practice in all industry, as everybody knows, has been raised immeasurably in the past 25 years. Lavish presents to

purchasing agents as well as to higher executives have been largely done away with as business has advanced to the higher ethical basis now so generally recognized. In like manner, we believe, the sentiment that has been growing against these things done in the name of convention hospitality will not be too long in bringing about their abolition.

Populism

THE debate and finally the vote in the Senate on the nomination of Mr. Hughes to be chief justice of the Supreme Court brought out more clearly than anything heretofore the disintegration of the two great political parties and the main economic issue on which the people of this country now divide. There is no good sense in deriding a certain group of senators. It is more rational to assume that they reflect a species of popular thought existing among their constituencies, else they would sooner or later cease to be senators. Some of them call themselves Republicans; others Democrats. This is only a matter of nomenclature and in itself evinces the downfall of party government among us. How many realize the immense importance of this change?

The questions of states rights, the tariff, and foreign policy no longer cleave the two parties. The new question—prohibition—divides each of them into wet and dry sections. The new alinement is between sober thought and populism, erroneously described as between conservatism and liberalism. Many of the persons who are characterized as conservatives are in fact liberal in their ideas, while those who profess to be liberals are so only in the sense of being free with the money of other people.

Our last remark leads to a crystallization of the points of view. In the recent debate one senator referred to the oppression of the common people. Another to the contest between organized capital and those who toil. While a third denounced the valuations upon public utilities that are fastening economic slavery upon the people. All of this is obviously economic twaddle.

The common people who have been blessed with automobiles, cheap gasoline, cheap amusements of many kinds, cheap food and clothing and improved house-keeping facilities are clearly not oppressed. The American Federation of Labor will agree that there is no contest between toilers and capitalists. The corporations are associations of millions of stockholders, most of whom are themselves toilers. The public utilities, instead of enslaving the people, have given them cheap light and power, and good telephone and telegraph service, and convenient urban and suburban transportation. What gives bad service to the common people is the Government whenever it undertakes anything, whether it be the post office, or municipal transportation, or electric light and power.

The present discontent is not on the part of the proletariat. It is rather a geographical disaffection, largely reflecting a dissension between rural labor and town labor. Incorporated in this complex thinking is a resentment against efficiency and an advocacy of the cause of the little man. Hence the grievance against the chain stores and mail order houses.

There is much that is perplexing, even preposterous,

in all of this. We are led to wonder to what extent the politicians really reflect public opinion and to what extent they themselves promote discontent. Anyhow, they are not to be belittled. They are doing much to spoil a constructive administration, which is liberal in the true sense of that term, and in their efforts to undermine the Supreme Court they give real cause for alarm.

Size Helps Steel's Growth

THE great size of the American steel industry is one of the chief causes of its vigorous growth. The principle, in brief, is that on account of size it can specialize on an item and yet have a large tonnage. The next three countries to the United States range roughly 20 to 30 per cent as large in steel production while the next nine range from 2 to 8 per cent. While in the last five years the United States has produced almost one-half of the world's steel output, at least ten other countries have usually produced a million tons or more. All of those countries are hampered, some of them greatly hampered, by inability to specialize their equipment for efficiency and low cost because they cannot gather up enough tonnage of demand.

One may observe the principle by looking back over our own history. We have large rolling units today which a quarter century ago were not even dreamed of. Of course they had not been "invented" at that time, but to invent means literally to "come upon" and one reason why they had not been come upon was because people were not looking for them—they had no employment for them.

Statistical data are not available for a comparison of the relative growth of iron castings and rolled steel in the United States and in the rest of the world but it is beyond question that the proportion of rolled steel to castings is higher in the United States than in the rest of the world, and that is largely because on account of quantity we can roll steel and fabricate it for various things when with a limited market it would be necessary to use a casting.

Perhaps the most impressive illustration of rapid growth recently is in the steel strip, which ten years ago was in the half-million ton class, getting above a million tons in 1925 and being above two million tons in the last two years. These strips are produced by a wide variety of mills, each specializing to produce economically a limited range of sizes. A 100,000-ton strip country could not do this. Its mills would have to be "flexible," at the expense of costs, and on account of price the material would make less headway.

The same principle that applies in rolling applies also in alloying, prior to rolling, and in heat treatment subsequent to rolling. Alloy steels would not have increased in tonnage as they have if large scale and economical operations were not possible. Normalizing was a very expensive operation at the outset but by there being a large tonnage efficient units have become possible.

At the present time the eyes of steel makers are upon specialties of all sorts, as a means to increase tonnage. A third of a century ago the attitude was precisely the reverse. Likewise aiming at tonnage, producers wanted all steel to be alike, as nearly as possible, both in composition and in section. Sales-

manship frequently consisted in convincing a prospective customer, wanting something different, that the regular thing would be all right. Today the prospective buyer who wants something different is the most welcome of all. Meet his requirements and probably others can be found who will buy the same thing. With a small industry and a small country the opportunities would be correspondingly small.

AS American automobile companies expand activities abroad by establishing more or less integrated plants in Europe, it is logical that they will seek under the dictation of economic expediency nearby sources of supply of raw materials and incidental equipment. One American steel producer evidently intends to participate in that supply program, as indi-

cated by the announcement last week that on March 1 the American Rolling Mill Co. will begin the operation under its own name of a manufacturing plant in England. That name is no new one to Europe, for there have been years of cultivation and intimate study of the European markets through the company's export subsidiary and through the licensing of British, French and German companies to make its products. Thus the company that has pioneered so successfully in making the term ingot iron internationally known and in revolutionizing the manufacture of sheets serves notice in its recent action that American-owned companies abroad as well as native fabricating industries may be able to obtain materials made by the processes followed in the United States, backed by experience gained in this country.

Aluminum Alloys Versus Steel

Structural Shapes of Strong, Light Alloys Incorporated in Street Cars, Cranes and Railroad Cars

IT has been recently said by a prominent scientist that competition is becoming more and more one of materials rather than of companies or of men. With this introductory remark, Dr. Francis C. Frary, president American Electrochemical Society and director of research, Aluminum Co. of America, New Kensington, Pa., addressed about 200 New York chemists at a joint meeting of the local sections of the American Electrochemical Society, the American Chemical Society, the Society of Chemical Industry and others, Friday evening, Feb. 14, at the Chemists' Club, New York. His subject was "Present-Day Aspects of the Aluminum Industry."

Iron and aluminum are the two most abundant metals in the earth's crust; iron, however, is comparatively easy to reduce from the ore in a blast furnace. To reduce aluminum from its ore, bauxite, said Dr. Frary, is by no means so easy. That is one reason why pig iron can be sold at \$20 per ton while aluminum is about 24c. to 25c. per lb. Even today, however, there is some competition between iron and aluminum, declared the speaker. A comprehensive description of the method of reducing the metal in electric furnaces from alumina followed.

Development of Alloys of Aluminum

A large portion of the address was devoted to a discussion of the origin and development of the wrought and cast alloys of aluminum. Dr. Frary pointed out how aluminum as a metal, because of its softness and low tensile strength, is of little value as an engineering material, either cast or rolled. It was soon discovered that an impure metal had excellent properties, that is, by alloying it with copper or silicon or with copper, manganese, magnesium and even iron, a series of products

results which, with certain heat treatments or aging, possess superior physical properties. Duralumin, Alclad, 17S, 25S and the 195 alloys were described as to their development, heat treatment, properties and applications with actual samples placed on exhibition and passed through the audience.

The 8 per cent copper-aluminum casting alloys as used for crankcases and the 5 to 10 per cent silicon die-casting alloys and their preparation and properties were discussed; then the fabricating products in which manganese plays a role, followed by those in which small percentages of copper, magnesium and manganese bestow unusual properties after heat treatment or aging. The dispersion of copper and its effect on hardness and physical properties was historically recounted. Then the discovery of Jeffries and Archer was outlined, that the elimination of magnesium produced an alloy that did not age naturally, but which after special heat treatment attained properties close or equal to that of mild steel, with a tensile strength of 45,000 to 50,000 lb. per sq. in.

Aluminum Alloys in Cars and Cranes

It is this latter alloy and some similar ones which are now being rolled into structural shapes in a new blooming and rolling mill at Massena, N. Y., which, it is expected, will in certain fields compete with steel. Already 14-in. channels are being produced.

Into street cars structural members of aluminum alloys have been incorporated. They are claimed to be able to carry the same load as steel and to reduce materially the 5c. per lb. cost of hauling the modern street car because of an initial weight of only half as much as the same car made of steel.

In cranes, also, these structural members have been incorporated. With gir-

ders of these alloys, a 10-ton crane, properly designed, weighs decidedly less than one of steel and carries the same weight. It is argued that ultimate savings offset the extra cost of the aluminum structural members. Loaded to 17 tons, it is said that there was no deflection in a 10-ton crane on a 72-ft. span. In a long building aluminum cranes save weight in steel.

In street cars Dr. Frary stated that the use of these alloys saves weight on motors sufficient to make up for the extra cost of the aluminum. For two years the Pennsylvania Railroad has had in experimental operation a nine-car train made largely of aluminum alloy structural members. The nine-car train is equal to an eight-car standard train in operating efficiency. And thus, said Dr. Frary, the competition of materials is already commencing—aluminum against iron and steel.

Westinghouse Lighting Work for Cleveland

The Westinghouse Electric & Mfg. Co. will centralize in Cleveland the manufacture of industrial and street lighting equipment, flood lights and airport lights. The division will be moved from South Bend, Ind., and located in the company's present plant at West Fifty-eighth Street and Bulkley Boulevard, Cleveland, which will be remodeled and enlarged. This plant has been used as a foundry. Part of the foundry equipment will be moved to Trafford City, Pa., and part to Sharon, Pa. The Cleveland foundry will continue to make castings for the lighting division and for the company's Mansfield, Ohio, works, where electrical household appliances, ranges and refrigerators are made. The Cleveland plant will be in charge of Charles G. Schluederberg, who has been general manager of the company's street lighting department. He will have the title of works manager and will also have supervision over the plants in South Bend and St. Louis.

Extension Asked of James E. Howard's Services

WASHINGTON, Feb. 18. — Earnest efforts are being made by the Interstate Commerce Commission, through its secretary, George B. McGinty, to stay the Civil Service law in order that the commission may retain the services of Dr. James E. Howard, aged 79, its safety engineer, regarded by the commission as the greatest expert in the Government service on rail failures, steel defects generally and other sources of railroad accidents. Apparently special legislation only will prevent the retirement on Aug. 20 of Mr. Howard under the Civil Service law, which says that "no employee shall be continued in the civil service of the United States beyond the age of retirement for more than four years." Mr. Howard has had five extensions beyond his retirement age and no further period of grace is possible unless granted by special legislation.

So indispensable are the services of Mr. Howard, in the opinion of the Interstate Commerce Commission, that his prospective retirement has been described as an "official calamity." Secretary McGinty wrote the Civil Service Commission that it will be "impossible to satisfactorily fill Howard's position," as he is an "outstanding figure in this particular field of engineering practice and research." Secretary McGinty explained that Mr. Howard had offered to continue his services without salary. The suggestion was made also as to the possibility of retaining Mr. Howard as a dollar-a-year man.

Newton Sheet Mills Started at Monroe, Mich.

E. F. Clark, president, and J. H. Fitch, vice-president, of the Newton Steel Co., were in charge of ceremonies Tuesday, when the company's new plant at Monroe, Mich., started operations. A group of six mills got under way. Invited guests included automobile manufacturers and other large users of full-finished sheets. The mills are manned by crews transferred from the company's plant at Newton Falls, Ohio.

The plant now employs 900 men and the number will be increased to 1500 as operations get into full swing. The mills are of the latest design, with continuous packs and heating furnaces, and contain the latest developments in annealing, pickling and cold rolling.

With this property, Newton Steel becomes one of the largest producers in the country of high-finished sheets, with annual capacity of 480,000 tons.

The Victoria furnace of the Canadian Furnace Co., Ltd., Port Colborne, Canada, was banked Feb. 11, for about six weeks in order to make repairs to the blowing engine and to rearrange bins at the stockhouse.

The Week in Business

Drift of Current Financial and Economic Opinion

OBSERVERS of the business trend rather generally emphasize at the moment the negative factors. With it all, however, there is considerable stressing of a steady, gradual climb upward. It is the appearance of weak spots and evidence of several contrary movements that bring out the special comments.

Portent of Farm Price Stabilization

Perhaps uppermost among the less optimistic comments are those that express concern over the portent of the attempts at price stabilization in the field of agriculture. The *Financial Chronicle* is not only convinced that this "Government meddling, and meddling of the worst kind," will be followed by an "inevitable crash" but that "unfortunately, too, the menace involved is beginning to have some effect upon general business. And there is grave danger that the revival in trade, which during the last six weeks has been proceeding with such great rapidity, may be arrested." It suggests, further, that the President's efforts to prevent large scale unemployment "may be foiled by this unhappy development."

A Wave of Economy

A spreading wave of economy, with all that this suggests as to the reduced consumption of 120,000,000 people, is seen by the *Bache Review*, but the view is that it will not extend to those things which help "to keep up appearances." For illustration, mention is made of the postponement of purchases of household appliances, floor coverings and furniture.

What is described as a world struggle against the fall of prices also comes in for attention. Concern over the danger to business appears to obtain chiefly in Europe, with some resignation that after all the laws of supply and demand must prevail, however temporarily any special efforts may serve to stay the trend.

The upward march of business as indicated by expansion in the steel industry seems not to be borne out by the amount of freight loaded by the railroads, and Benjamin Baker in the *Annalist* expects the

discordances in the January record to mean some further, if slight, decline in February "before the whole complex of conditions is so readjusted as to make possible a continuous upward movement." Statements respecting the volume of unemployment are not of the oneness that indicates marked betterment.

Seek to Call the Turn

Aside from the foregoing and indications reported by the National Industrial Conference Board that curtailment of industrial activity has spread to the fields of distribution, the aspects of the business situation are widely regarded as highly favorable. The Harvard Economic Society believes the lowered discount rates at New York and elsewhere increase the probability of business improvement in the next two or three months.

If anything there is increasing agreement that the low point of activity in the metal-working field will be reached in June or July, which would mean that the equipment makers cannot look for much increase in sales in the immediate future. Col. Leonard P. Ayres, in the *Bulletin of the Cleveland Trust Co.*, says the bottom of the business decline appears to have been reached. Comparing the present with the sub-normal periods of 1924 and 1927, it seems probable to him that recovery this year will be prompt, "but that is not yet sure." Severe winter weather, he says, may be holding building work back, and while construction is below normal, the figures are not getting worse as the weeks pass. Nor is freight traffic showing notable decreases.

The amount of loans of reporting member banks of the Federal Reserve System still appears to the National Industrial Conference Board to be out of line with industrial activity and the distribution of commodities. Its opinion is that the more favorable aspects of the business situation are to be found in the continued easing of the credit situation and the decline in the amount of liabilities of commercial failures reported in January after the rapid increase over the year-end.

Iron and Steel Markets

Production Makes Further Gain

Total Ingot Output Increases Slightly, But Demand Grows Uneven—Some Raw Steel Being Stocked—General Advance in Scrap at Chicago

STEEL production has made a further slight gain, but has lost the momentum that caused it to rise so rapidly in January. Demand is uneven, with declines in certain districts offset by increases in others. This contrast is especially sharp in automotive steels, with Pittsburgh reporting heavier, and other centers lighter, releases.

Ingot output at Pittsburgh, 75 per cent a week ago, is now nearly 80 per cent of capacity and a similar rate prevails in the Valley. Raw steel production, however, appears to average 5 to 10 points above finishing mill operations, indicating the accumulation of surplus metal to meet expected expansion of demand in the spring. At Chicago, new business has receded but specifications fully support an ingot output of 90 per cent. Average raw steel production for the country at large is estimated at 82 per cent, with the Steel Corporation rate at 85 per cent.

Requirements of consuming industries show little change. Motor car manufacturers outside of Ford and Chevrolet are adhering to a cautious policy in ordering steel and their February output will exceed that of January by only a small margin. All automobile companies are stocking up their dealers, but until spring buying by car users gets under way, they will have no accurate measure of ultimate demand. Current automotive consumption of steel is estimated at 60 per cent of normal.

The railroads and heavy construction are still giving the market conspicuous support. With the rail buying movement virtually concluded, orders placed by small Western lines at Chicago totaled 15,000 tons. Business in track supplies aggregated 11,000 tons. Freight cars placed during the week numbered 2471, including 1800 for the Louisville & Nashville and 500 for the Canadian Pacific.

Structural steel lettings, at 32,000 tons, compare with bookings of more than 50,000 tons in each of the three previous weeks. New inquiries, at 52,000 tons, were the largest this year. Reinforcing bar awards, totaling more than 8000 tons, were the heaviest for any week since early in November.

Residential construction remains at a low ebb, and makers of merchant pipe, radiators and sanitary ware have been unable to increase their production schedules.

Tin plate output is undergoing seasonal growth, with two or three mills now running at close to capacity. The outlook in oil country pipe is not promising, but considerable line pipe steel may soon be released to the mills. Fresh inquiries for oil storage tanks, calling for 10,000 tons of plates, have raised the amount of pending tankage steel to 30,000 tons. Steel demand from the farm equipment industry is sustained at a high level.

Finished steel prices, barring scattered irregularities, are holding their own. Scrap has undergone a general advance at Chicago, with heavy melting grade up another 25c. a ton, but other old material markets are largely unchanged, though steady.

Pig iron buying is at close range and foundry melt is uneven, although showing a slow expansion in the aggregate. The greatest improvement is reported at Chicago, where February shipments promise to exceed those of last month by more than 12 per cent. Many producers lack satisfactory backlogs, in view of short-term sales, but active capacity has been augmented by the blowing in of a merchant furnace at Buffalo and a steel works stack in the Youngstown district. A Delaware River cast iron pipe maker has bought 10,000 tons of iron for barge shipment.

Last year's prices on Lake Superior iron ore are likely to be reestablished for the coming season. In 1929 the market advanced 25c. a ton, the first price change in four years. As a result of the slowing down of the iron and steel industry in the closing months of last year, consumers have larger stocks of ore on their furnace yards than they would be normally carrying at this time.

Fabricated steel bookings in January are put at 261,800 tons, compared with 319,550 tons in December and 227,150 tons in November.

Swedish works will supply 1200 tons of stainless steel plates for the Assouan Dam in Egypt at a price of \$584,400.

THE IRON AGE composite prices are unchanged, pig iron at \$18 a ton and finished steel at 2.305c. a lb. Pig iron is 38c. a gross ton lower than a year ago; finished steel is \$1.72 a net ton lower.

A Comparison of Prices

Market Prices at Date, and One Week, One Month and One Year Previous,
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron, Per Gross Ton:	Feb. 18, 1930	Feb. 10, 1930	Jan. 21, 1930	Feb. 19, 1929
No. 2 fdy., Philadelphia.....	\$20.76	\$20.76	\$20.76	\$21.26
No. 2, Valley furnace.....	18.50	18.50	18.50	17.50
No. 2, Southern, Cin'ti.....	17.19	17.19	17.69	20.19
No. 2, Birmingham.....	14.50	14.50	14.50	16.50
No. 2 foundry, Chicago*.....	20.00	20.00	20.00	20.00
Basic, del'd eastern Pa.....	19.50	19.50	19.50	20.25
Basic, Valley furnace.....	18.50	18.50	18.50	17.50
Valley Bessemer, del'd P'gh..	20.76	20.76	20.76	20.01
Malleable, Chicago*.....	20.00	20.00	20.00	20.00
Malleable, Valley.....	19.00	19.00	19.00	18.00
L. S. charcoal, Chicago.....	27.04	27.04	27.04	27.04
Ferromanganese, furnace.....	94.00	94.00	100.00	105.00

Rails, Billets, etc., Per Gross Ton:	Feb. 18, 1930	Feb. 10, 1930	Jan. 21, 1930	Feb. 19, 1929
Rails, heavy, at mill.....	\$43.00	\$43.00	\$43.00	\$43.00
Light rails at mill.....	36.00	36.00	36.00	36.00
Rerolling billets, Pittsburgh..	33.00	33.00	34.00	33.00
Sheet bars, Pittsburgh.....	33.00	33.00	34.00	34.00
Slabs, Pittsburgh.....	33.00	33.00	34.00	33.00
Forging billets, Pittsburgh.....	38.00	38.00	39.00	38.00
Wire rods, Pittsburgh.....	40.00	40.00	40.00	42.00
Skelp, grvd. steel, P'gh, lb...	1.85	1.85	1.85	1.90

Finished Steel, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Bars, Pittsburgh.....	1.85	1.85	1.90	1.90
Bars, Chicago.....	1.95	1.95	2.00	2.00
Bars, Cleveland.....	1.85	1.85	1.85	1.90
Bars, New York.....	2.19	2.19	2.24	2.24
Tank plates, Pittsburgh.....	1.80	1.80	1.80	1.90
Tank plates, Chicago.....	1.95	1.95	2.00	2.00
Tank plates, New York.....	2.07½	2.07½	2.02½	2.17½
Structural shapes, P'gh.....	1.80	1.80	1.80	1.90
Structural shapes, Chicago...	1.95	1.95	2.00	2.00
Structural shapes, New York...	2.04¼	2.04¼	2.04¼	2.14¼
Cold-finished bars, Pittsburgh	2.10	2.10	2.10	2.20
Hot-rolled strips, Pittsburgh..	1.80	1.80	1.80	1.80
Cold-rolled strips, Pittsburgh.	2.65	2.65	2.65	2.85

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Finished Steel, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 24, P'gh...	2.60	2.50	2.60	2.85
Sheets, black, No. 24, Chicago	2.75	2.75	2.75	2.95
dist. mill.....	3.30	3.30	3.30	3.60
Sheets, galv., No. 24, P'gh...	3.40	3.40	3.40	3.70
Sheets, galv., No. 24, Chicago	2.25	2.25	2.25	2.20
dist. mill.....	2.35	2.35	2.35	2.30
Wire nails, Pittsburgh.....	2.25	2.25	2.30	2.65
Wire nails, Chicago dist. mill.	2.35	2.35	2.35	2.70
Plain wire, Pittsburgh.....	2.40	2.40	2.40	2.50
Plain wire, Chicago dist. mill.	2.45	2.45	2.45	2.55
Barbed wire, galv., P'gh.....	2.95	2.95	2.95	3.30
Barbed wire, galv., Chicago	3.00	3.00	3.00	3.25
dist. mill.....	\$5.25	\$5.25	\$5.25	\$5.35
Tin plate, 100 lb. box, P'gh.				

Old Material, Per Gross Ton:	Feb. 18, 1930	Feb. 10, 1930	Jan. 21, 1930	Feb. 19, 1929
Heavy melting steel, P'gh....	\$17.00	\$17.00	\$16.75	\$18.50
Heavy melting steel, Phila....	14.50	14.50	14.50	16.50
Heavy melting steel, Ch'go....	13.50	13.25	12.75	15.75
Carwheels, Chicago.....	15.00	14.50	13.75	14.50
Carwheels, Philadelphia.....	15.00	15.00	15.00	16.50
No. 1 cast, Pittsburgh.....	14.50	14.50	14.50	15.00
No. 1 cast, Philadelphia.....	15.00	15.00	15.00	16.50
No. 1 cast, Ch'go (net ton)...	14.00	13.50	13.50	16.00
No. 1 RR. wrot., Phila.....	15.00	15.00	15.00	16.00
No. 1 RR. wrot., Ch'go (net)	12.25	12.00	12.00	14.00

Coke, Connellsville, Per Net Ton at Oven:	Feb. 18, 1930	Feb. 10, 1930	Jan. 21, 1930	Feb. 19, 1929
Furnace coke, prompt.....	\$2.60	\$2.60	\$2.50	\$3.00
Foundry coke, prompt.....	3.50	3.50	3.50	3.75

Metals, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York.....	18.12½	18.12½	18.12½	18.12½
Electrolytic copper, refinery..	17.75	17.75	17.75	17.75
Tin (Straits), New York.....	38.75	38.87½	37.75	49.25
Zinc, East St. Louis.....	5.20	5.20	5.15	6.35
Zinc, New York.....	5.55	5.55	5.50	6.70
Lead, St. Louis.....	6.10	6.10	6.10	6.85
Lead, New York.....	6.25	6.25	6.25	6.95
Antimony (Asiatic), N. Y. ...	8.75	8.75	8.75	9.62½

Pittsburgh

Steel Improvement Continues, Though at a Slower Pace— Ingot Output Now at About 80 Per Cent

PITTSBURGH, Feb. 18.—Steel-making operations in Pittsburgh and nearby districts are continuing the improvement which began with the new year, but which has been less pronounced in February. Open-hearth furnaces are now running at nearly 80 per cent of theoretical capacity, with a similar rate in the Valleys, while a slightly higher figure prevails at some of the mills down the Ohio River. Such operating schedules are rather high in comparison with the requirements of finishing mills, although structural mills are well engaged and rail production is approaching capacity. Tin mill operations at some points are also nearing capacity and heavy demand for hot-rolled strip has lengthened deliveries in the Valleys to as much as two weeks. However, schedules of finishing mills in the aggregate average 5 to 10 points under ingot operations, and a few companies freely admit that surplus steel is being accumulated to meet an expected heavy demand in the late spring months.

Such improvement in steel specifications as has been reported in February is attributable principally to the automobile industry. Nearly all the motor car builders plan a larger output this month than last, in spite of the fewer working days, and some companies hope for capacity output before the end of the quarter. This will naturally stimulate demand for steel bars, sheets, strip steel and cold-

finished material, products which have suffered most in the last three months.

Tin plate demand is also beginning its definite seasonal upturn, and releases on railroad track equipment are stimulated seasonably in the spring months. Railroad car builders have comfortable backlogs, and recent large orders assure heavy shipments to this industry in the next six months.

The building industry continues

enigmatic. Lower money rates have not yet had much effect on new construction permits in this area, although makers of steel and iron products which go into construction work are still optimistic. The volume of large engineering projects requiring heavy structural steel and reinforcing bar tonnages has seen little interruption, and industrial building programs bulk large. However, residential and other construction is still limited, and makers of standard pipe, radiators and sanitary equipment reflect no improvement in their production schedules.

Little can be expected from the oil industry, but line pipe projects are being considered in many localities. Of local interest is a line which the Sun Oil Co. expects to build across Pennsylvania with outlets at Lake Erie and eastern Ohio points.

Prices are gaining strength in a limited way. Bars, shapes and plates are achieving comparative stability at 1.85c., Pittsburgh, although lower quotations persist on heavy tonnage. Sheets are firmer, but are still subject to occasional shading. Strip steel seems to be steady on all ordinary transactions. Talk of second quarter price advances on many prod-

ucts is heard, but steel makers believe that present minimum quotations must be firmly established before higher figures are named.

Pig Iron.—Small sales of pig iron continue to gain in number, but heavy volume buying is still lacking. Contract buyers are increasing their shipments, and the movement from Valley furnaces so far this month is ahead of the corresponding January period with most makers. However, producers are rather dissatisfied with conditions, as many of them lack substantial backlog tonnage, and it is difficult to dispose of the entire output of a merchant furnace on small sales. However, furnace stocks are not increasing, even though four merchant stacks are in blast in the Valley and two steel companies are depending on outside demand to utilize the production of two other stacks. Large buyers of pig iron still hesitate to come into the market. Sales of basic iron are notably few. However, the price of basic is still quoted nominally at \$18.50, Valley, with foundry iron bringing the same price in recent small transactions. Bessemer and malleable are quoted at \$19, Valley. The Republic Iron & Steel Co. has blown in its fourth Haselton stack.

Prices per gross ton, f.o.b. Valley furnace:

Basic	\$18.50
Bessemer	19.00
Gray forge	18.00
No. 2 foundry	18.50
No. 3 foundry	18.00
Malleable	19.00
Low phos., copper free	27.00

Freight rate to Pittsburgh or Cleveland district, \$1.76.

Prices per gross ton, f.o.b. Pittsburgh district furnace:

Basic	\$19.00
No. 2 foundry	19.00
No. 3 foundry	18.50
Malleable	19.50

Freight rates to points in Pittsburgh district range from 63c. to \$1.13.

Semi-Finished Steel.—The market continues generally quiet, although occasional small spot sales are reported from time to time. Large buyers seem to be covered for the remainder of the quarter. The price on billets, slabs and sheet bars stands at \$33, Pittsburgh or Youngstown. Forging billets are commanding the usual \$5 a ton premium. Wire rods are un-

changed at \$40. It is admitted that a few large buyers have contracts at less than \$40, although spot business could hardly be placed for less, and the differential is not being extended to companies which do not ordinarily enjoy it.

Bars, Shapes and Plates.—Specifications for the heavy hot-rolled products are holding up to the January average, although some mills report plate demand slightly less active, while tonnage releases on bars are somewhat heavier. The structural business has never fully reflected the decline which was evident in other lines, as shipments are not so closely allied with current orders as they are in bars and plates. A number of large projects have been placed since the first of the year, and, with more in prospect, there is no reason to expect any slackening in this line before additional activity develops in the spring. Railroad car builders have been rather slow to place their specifications, but added business which has come to nearby shops in the last two or three weeks is expected to stimulate specifications materially. Most of the improvement in bar demand is coming from the automobile industry, although agricultural implement makers are still large users, and reinforcing bars are more active. The 1.85c. price on bars, shapes and plates now applies to most of the current business, although lower figures are occasionally named on particularly attractive plate and shape tonnages.

Rails and Track Supplies.—Specifications this month have not been as heavy as they were in the corresponding period of January, although demand is steady and rail laying will assume large proportions as milder weather develops. Some of the larger carriers are distributing their tonnage more evenly this year, and the peak in spring shipments may be somewhat lower this year than usual. However, this will be reflected in a better demand in the late summer and fall months, and aggregate tonnage is expected to show no decrease from 1929.

Tubular Goods.—The pipe business is holding its own, although the present month has brought no marked improvement in demand. Line pipe in-

quiries have not passed the rumor stage, although several large projects which have been mentioned are likely to come up for bids before the middle of the year. The oil industry offers little encouragement, and makers of pipe suitable for this work are none too optimistic about the year's business. Demand for mechanical tubing is still only fair, while boiler tubes are moving rather well.

Wire Products.—Manufacturers' wire is still fairly active, with shipments to the automobile industry somewhat heavier than they were last month. Merchant wire products are dull, as jobbers stocked up well early in January, and little increased demand is expected before late next month. Prices are unchanged, with nails going to the trade at \$2.30, Pittsburgh, and large jobbers having little difficulty in getting \$2.25. However, buying is limited at this time. Manufacturers' wire is still quoted at 2.40c., Pittsburgh, and annealed fence wire at 2.45c.

Sheets.—Demand for sheets has been stronger in the last week, the leading interest having had heavier specifications than it has enjoyed in several months. The automobile industry has accounted for a large part of the increased specifications, as February schedules of most makers show a fair improvement over January and further increases in output are expected for March. However, other sheet consumers are busier, notably the railroad car builders. The radio industry has made little recovery, but electric refrigerator manufacturers are beginning to prepare for spring demand and are better sheet users. In line with stronger demand, prices have gained stability. Extreme concessions are less common, and the larger makers of sheets are adhering to minimum quotations recently established of 2.65c., Pittsburgh, on black sheets, 3.30c. on galvanized and 2.10c. and 2.25c. on light plates and blue annealed sheets. Automobile body sheets are holding, except possibly to one large buyer, at 3.90c., and metal furniture at 3.90c. to 4c. Operations this week average from 75 to 80 per cent, with one or two makers running almost at capacity.

THE IRON AGE Composite Prices

Finished Steel

Feb. 18, 1930, 2.305c. a Lb.

One week ago	2.305c.
One month ago	2.312c.
One year ago	2.391c.

Based on steel bars, beams, tank plates, wire, rails, black pipe and black sheets. These products make 87 per cent of the United States output of finished steel.

	High	Low
1929	2.412c., April 2;	2.362c., Oct. 29
1928	2.391c., Dec. 11;	2.314c., Jan. 3
1927	2.453c., Jan. 4;	2.293c., Oct. 25
1926	2.453c., Jan. 5;	2.403c., May 18
1925	2.560c., Jan. 6;	2.396c., Aug. 18

Pig Iron

Feb. 18, 1930, \$18.00 a Gross Ton

One week ago	\$18.00
One month ago	18.17
One year ago	18.38

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High	Low
1929	\$18.71, May 14;	\$18.21, Dec. 17
1928	18.59, Nov. 27;	17.04, July 24
1927	19.71, Jan. 4;	17.54, Nov. 1
1926	21.54, Jan. 5;	19.46, July 13
1925	22.50, Jan. 13;	18.96, July 7

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base per Lb.
F.o.b. Pittsburgh mill.....	1.85c. to 1.90c.
F.o.b. Chicago	1.95c. to 2.00c.
Del'd Philadelphia	2.17c. to 2.22c.
Del'd New York	2.19c. to 2.24c.
Del'd Cleveland	1.85c.
F.o.b. Cleveland	1.85c.
F.o.b. Lackawanna	2.00c.
F.o.b. Birmingham	2.00c.
C.I.f. Pacific ports	2.35c.
F.o.b. San Francisco mills	2.35c.

Billet Steel Reinforcing

F.o.b. Pittsburgh mills, 40, 50, 60-ft.....	1.95c.
F.o.b. Pittsburgh mills, cut lengths.....	2.20c.
F.o.b. Birmingham, mill lengths.....	2.00c.

Rail Steel

F.o.b. mills, east of Chicago dist.....	1.80c. to 1.90c.
F.o.b. Chicago Heights mill.....	1.85c.
Del'd Philadelphia.....	2.12c. to 2.22c.

Iron

Common iron, f.o.b. Chicago.....	1.95c. to 2.00c.
Refined iron, f.o.b. P'gh mills.....	2.75c.
Common iron, del'd Philadelphia.....	2.12c.
Common iron, del'd New York.....	2.14c.

Tank Plates

	Base per Lb.
F.o.b. Pittsburgh mill.....	1.80c. to 1.90c.
F.o.b. Chicago	1.95c. to 2.00c.
F.o.b. Birmingham	2.00c.
Del'd Cleveland	1.99c. to 2.04c.
Del'd Philadelphia	2.00c. to 2.05c.
F.o.b. Coatesville	1.90c. to 1.95c.
F.o.b. Sparrows Point.....	1.90c. to 1.95c.
F.o.b. Lackawanna	1.90c. to 1.95c.
Del'd New York.....	2.07½c. to 2.12½c.
C.I.f. Pacific ports.....	2.25c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh mill.....	1.80c. to 1.90c.
F.o.b. Chicago	1.95c. to 2.00c.
F.o.b. Birmingham	2.00c.
F.o.b. Lackawanna	1.90c. to 1.95c.
F.o.b. Bethlehem	1.90c. to 1.95c.
Del'd Cleveland	2.04c.
Del'd Philadelphia	1.86c. to 2.01c.
Del'd New York.....	2.04½c. to 2.09½c.
C.I.f. Pacific Ports.....	2.35c.

Hot-Rolled Hoops, Bands and Strips

	Base per Lb.
6 in. and narrower, P'gh.....	1.90c.
Wider than 6 in., P'gh.....	1.80c.
6 in. and narrower, Chicago.....	2.10c.
Wider than 6 in., Chicago.....	2.00c.
Cooperage stock, P'gh.....	2.20c.
Cooperage stock, Chicago.....	2.30c.

Cold-Finished Steel

	Base per Lb.
Bars, f.o.b. Pittsburgh mill.....	2.10c.
Bars, f.o.b. Chicago.....	2.10c.
Bars, Cleveland	2.10c.
Bars, Buffalo	2.10c.
Shafting, ground, f.o.b. mill.....	2.45c. to 3.40c.
Strips, P'gh	2.65c. to 2.75c.
Strips, Cleveland	2.65c. to 2.75c.
Strips, del'd Chicago	2.95c.
Strips, Worcester	2.80c. to 2.90c.
Fender stock, No. 20 gage, Pittsburgh or Cleveland	4.00c.

*According to size.

Wire Products

(Carload lots, f.o.b. Pittsburgh and Cleveland.)
To Merchant Trade

	Base per Keg
Standard wire nails.....	\$2.25 to \$2.30
Cement coated nails.....	2.30
Galvanized nails	4.30

	Base per Lb.
Polished staples	2.75c.
Galvanized staples	3.00c.
Barbed wire, galvanized.....	2.95c.
Annealed fence wire	2.45c.
Galvanized wire, No. 9.....	2.90c.
Woven wire fence (per net ton to retailers).....	\$65.00

To Manufacturing Trade

Bright hard wire, Nos. 6 to 9 gage.....	2.40c.
Spring wire	3.50c.
(Carload lots, f.o.b. Chicago)	
Wire nails	\$2.35 to \$2.45 (keg)
Annealed fence wire.....	2.50c. to 2.60c. (lb.)
Bright hard wire to manufacturing trade.....	2.45c.
Anderson, Ind., mill prices are ordinarily \$1 a ton over Pittsburgh base; Duluth, Minn., mill \$2 a ton over Pittsburgh, and Birmingham mill \$3 a ton over Pittsburgh.	

Cut Nails

	Per 100 Lb.
Carloads, Wheeling, Reading or Northumberland, Pa.	\$2.55 to \$2.60
Less carloads, Wheeling or Reading	2.70

Light Plates

No. 10, blue annealed, f.o.b. P'gh.....	2.10c.
No. 10, blue annealed, f.o.b. Chicago dist.....	2.20c.
No. 10, blue annealed, del'd Phila.....	2.42c.
No. 10, blue annealed, B'ham.....	2.25c.

Sheets

Blue Annealed

	Base per Lb.
No. 13, f.o.b. P'gh.....	2.25c.
No. 13, f.o.b. Chicago dist.....	2.35c.
No. 13, del'd Philadelphia	2.57c.
No. 13, blue annealed, B'ham.....	2.50c.

Continuous Mill Sheets

No. 10 gage, f.o.b. P'gh.....	1.90c. to 2.00c.
No. 13 gage, f.o.b. P'gh.....	2.00c. to 2.15c.

(Usual range 24 in. to 48 in. wide)

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh.....	2.60c. to 2.65c.
No. 24, f.o.b. Chicago dist. mill.....	2.75c. to 2.85c.
No. 24, del'd Philadelphia	2.92c. to 3.07c.
No. 24, f.o.b. Birmingham.....	2.90c.

Metal Furniture Sheets

No. 24, f.o.b. P'gh.....	3.90 c. to 4.00c.
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Galvanized

No. 24, f.o.b. Pittsburgh.....	3.30c. to 3.40c.
No. 24, f.o.b. Chicago dist. mill.....	3.40c. to 3.50c.
No. 24, del'd Cleveland	3.49c. to 3.59c.
No. 24, del'd Philadelphia	3.62c. to 3.72c.
No. 24, f.o.b. Birmingham.....	3.45c. to 3.50c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh.....	2.90c. to 3.00c.
No. 28, f.o.b. Chicago dist. mill.....	3.00c. to 3.10c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh.....	3.90c.
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Long Ternes

No. 24, 8-lb. coating, f.o.b. mill.....	3.90c. to 4.00c.
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Vitreous Enameling Stock

No. 24, f.o.b. Pittsburgh	3.90c.
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Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills.....	\$5.25
Standard cokes, f.o.b. Gary.....	5.35

Terne Plate

(F.o.b. Morgantown or Pittsburgh)
(Per Package, 20 x 28 in.)

8-lb. coating I.C. \$10.70	25-lb. coating I.C. \$15.90
15-lb. coating I.C. 13.40	30-lb. coating I.C. 16.80
20-lb. coating I.C. 14.60	40-lb. coating I.C. 18.80

Alloy Steel Bars

(F.o.b. makers' mill)

Alloy	Quantity	Bar Base, 2.65c. per Lb.	Alloy
S.A.E. Series			Differential
Numbers			
2000 (¼% Nickel).....			\$0.25
2100 (1½% Nickel).....			0.55
2300 (¾% Nickel).....			1.50
2500 (5% Nickel).....			2.25
3100 Nickel Chromium			0.55
3200 Nickel Chromium			1.35
3300 Nickel Chromium			3.80
3400 Nickel Chromium			3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum).....			0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum).....			0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel).....			1.05
5100 Chromium Steel (0.60 to 0.90 Chromium).....			0.35
5100 Chromium Steel (0.80 to 1.10 Chromium).....			0.45
5100 Chromium Spring Steel.....			0.20
6100 Chromium Vanadium Bars.....			1.20
6100 Chromium Vanadium Spring Steel			0.95
9250 Silicon Manganese Spring Steel (flats).....			0.25
Rounds and squares.....			0.50
Chromium Nickel Vanadium			1.50
Carbon Vanadium			0.95

Above prices are for hot rolled steel bars, forging quality. The differential for cold-drawn bars is ¼c. a lb. higher, with standard classification for cold-finished alloy steel bars applying. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis.

Billets under 4 x 4 in. carry the steel bar base. Slabs with a sectional area of 16 in. or over carry the billet price. Slabs with sectional area of less than 16 in. or less than 2½ in. thick, regardless of sectional area, take the bar price.

Rails

	Per Gross Ton
Standard, f.o.b. mill	\$43.00
Light (from billets), f.o.b. mill.....	36.00
Light (from rail steel), f.o.b. mill.....	34.00
Light (from billets), f.o.b. Ch'go mill.....	36.00

Track Equipment

	Base per 100 Lb.
Spikes, ½ in. and larger.....	\$2.80
Spikes, ½ in. and smaller.....	2.80
Spikes, boat and barge.....	3.00
Tie plate, steel.....	2.07½

Angle bars	\$2.75
Track bolts, to steam railroads.....	\$3.80 to 4.00
Track bolts, to jobbers, all sizes, per 100 count	70 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld			Iron		
Inches	Steel	Galv.	Inches	Black	Galv.
1/8	45	19½	1/8	11	+36
1/4	51	25½	1/4	23	5
3/8	56	42½	3/8	28	11
1/2	60	48½	1 and 1½	31	15
1 to 3....	62	50½	1½ and 2	35	18
Lap Weld					
2	55	43½	2	23	9
2½ to 6	59	47½	2½ to 3½	28	13
7 and 8....	56	43½	4 to 6....	30	17
9 and 10	54	42½	7 and 8....	29	16
11 and 12	53	40½	9 to 12....	26	11

Butt Weld, extra strong, plain ends

1/8	41	24½	2 to 3....	61	50½
1/4 to 3/8	47	30½	3/4 and 1	+13	+48
1/2	53	42½	3/8	23	7
3/4	58	47½	1	28	12
1 to 1½	60	49½	1 to 2....	34	18

Lap Weld, extra strong, plain ends

2	53	42½	2½	39	13
2½ to 4	57	46½	2½ to 4	34	20
4½ to 6	56	45½	4½ to 6	33	19
7 to 8....	52	39½	7 and 8....	31	17
9 and 10	45	32½	9 to 12....	21	8
11 and 12	44	31½			

On carloads the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Steel		Charcoal Iron	
2 in. and 2½ in..	38	1½ in.	1
2½ in.—2¾ in..	46	1¾ in.	8
3 in.	52	2 in.—2½ in..	13
3½ in.—3¾ in..	54	2½ in.—2¾ in..	16
4 in.	57	3 in.	17
4½ in. to 6 in..	46	3½ in. to 3¾ in.	18
		4 in.	20
		4½ in.	21

On lots of a carload or more, the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts:

Lap Welded Steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload, 4 points under base and two fives. Charcoal Iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five.

Standard Commercial Seamless Boiler Tubes

Cold Drawn	
1 in.	61
1½ to 1¾ in..	53
1¾ in.	37
2 to 2½ in..	32
2½ to 3 in.	40
3 in.	52
3½ to 3¾ in..	54
4 in.	57
4½, 5 and 6 in..	46

Hot Rolled

2 and 2½ in..	38
2½ and 2¾ in..	46
3 in.	52

Beyond the above base discounts a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb., base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points, with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage take the mechanical tube list and discounts. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30%, base (carloads).....	55
Carbon, 0.30% to 0.40%, base.....	50
Plus differentials for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.	

Tin Plate.—Tin mill schedules are gradually being stepped up as the active season approaches, and two or three makers are now running at close to capacity. Others range down to about 60 per cent, with the leading interest at about 75 per cent. April specifications are reaching mills in fair volume, although some of the larger consumers have not yet made known their wants for this period.

Strip Steel.—Demand for hot-rolled strip steel is retaining its recent increases and specifications thus far in February are 20 to 25 per cent heavier than they were in the corresponding period last month. As a result, operations average 60 to 70 per cent of capacity, with schedules now extended for a week or 10 days. Cold-rolled material has failed to show a corresponding increase and demand is still very dull. Operations are still not above 40 per cent of capacity. Prices are fairly well established at 2.65c., Pittsburgh, for cold-rolled material, and 1.80c. and 1.90c. for hot-rolled, depending upon width.

Cold-Finished Steel Bars and Shafting.—Improved demand is reported by some makers, but business thus far in February is not much ahead of January. Automobile makers have increased their tonnage slightly, but not enough of the cold-finished output of this district goes to that industry to make for a sharp increase in shipments. Prices are holding at 2.10c., Pittsburgh, for bars, and 2.45c. to 3.40c., for shafting.

Coke.—Buying is confined to small lots, and the furnace coke market is particularly quiet so far as large inquiries are concerned. However, the \$2.60, Connellsville, price is holding, and demand and production are well adjusted. Heating coke has tapered off since the first of the month, and buying for the remainder of the sea-

son will be confined to small lots. Shipments of foundry coke are increasing gradually, but new buying is restricted and limited to small tonnages.

Old Material.—The scrap market has held its ground in the last week, although the spread on No. 1 heavy melting steel has narrowed somewhat. No further sales of railroad steel at \$17.50 have been reported, the highest price paid by a mill in the last week having been \$17.25. This consequently represents the top of the market, and, even though dealers are said to be able to cover at some points for as little as \$16, buying prices on a good grade of steel scrap range from \$16.50 to \$17. Under the circumstances, heavy melting steel is quotable this week at \$16.75 to \$17.25, with future tendencies not clearly defined. Hydraulic compressed sheets continue quiet, with no sales reported in the Pittsburgh district, but with considerable activity in the Valleys. Dealers are paying \$16.25 and better to cover old orders here, and the market is still quotable at \$16.25* to \$16.50. Changes in the other grades are mixed. Specialties are stronger, with sales to melters at \$21.25 and \$21.50. No. 2 steel is also stronger, with dealers offering \$14.75 to cover

at one large consuming point. The blast furnace grades are weaker on account of a holdup at one consuming point.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Grades:		
No. 1 heavy melting steel..	\$16.75 to	\$17.25
No. 2 heavy melting steel..	14.75 to	15.25
Scrap rails	16.00 to	16.50
Compressed sheet steel....	16.25 to	16.50
Bundled sheets, sides and ends	14.00 to	14.50
Cast iron carwheels.....	14.50 to	15.00
Sheet bar crops, ordinary..	18.00 to	18.50
Heavy breakable cast.....	12.00 to	13.00
No. 2 railroad wrought....	16.75 to	17.25
Hvy. steel axle turnings....	14.00 to	14.50
Machine shop turnings....	11.50 to	12.00
Acid Open-Hearth Grades:		
Railr. knuckles and couplers	20.50 to	21.50
Railr. coll and leaf springs	20.50 to	21.50
Rolled steel wheels.....	20.50 to	21.50
Low phos. billet and bloom ends	21.50 to	22.50
Low phos. mill plates.....	20.00 to	21.00
Low phos. light grades....	20.00 to	21.00
Low phos. sheet bar crops..	21.00 to	22.00
Heavy steel axle turnings..	14.00 to	14.50
Electric Furnace Grades:		
Low phos. punchings	18.50 to	19.50
Hvy. steel axle turnings..	14.00 to	14.50
Blast Furnace Grades:		
Short shoveling steel turnings	11.50 to	12.00
Short mixed borings and turnings	11.50 to	12.00
Cast iron borings.....	11.50 to	12.00
Rolling Mill Grades:		
Steel car axles	20.50 to	21.50
Cupola Grades:		
No. 1 cast	14.00 to	15.00
Rails 3 ft. and under.....	18.50 to	19.50

Senate Reduces Iron and Steel Duties

Lower Schedules Voted on Cast Iron Pipe, Hollow Drill Steel and Wire Rods—Aluminum Tariff Lowered

WASHINGTON, Feb. 18.—Taking up individual amendments to the metal schedule of the tariff bill, the Senate yesterday by a vote of 30 to 25 reduced the duty on cast iron pipe from 30 to 25 per cent and by a vote of 39 to 38 struck out the provision carrying an additional duty of 1.3c. a lb. on hollow drill steel valued at more than 4c. a lb. The basic duty on hollow drill steel is 1.7c. a lb. Under the Senate amendment, this latter rate would apply to all hollow drill steel, regardless of its value.

On Saturday the Senate by a viva voce vote placed sponge iron in the pig iron paragraph, carrying a duty of 75c. a ton. Sponge iron, as previously passed by the Senate when Finance Committee amendments were being voted on was, through an oversight, restored to paragraph 214 of the earthenware schedule carrying a duty of 30 per cent, amounting to \$9 a ton, the Senate having rejected the Finance Committee amendment proposing a duty of \$2 a ton. The House bill carried a duty of 0.3c. a lb. or \$6.72 a ton.

All of the amendments to the metal schedule were introduced by Senator Barkley, Democrat, of Kentucky, having charge for the Democratic and Progressive Republican forces, known as the coalition. A number of them, however, were sponsored by other senators. The reduced duty on hollow

drill steel was prompted by an amendment, prepared by Senator Walsh, Democrat, of Massachusetts.

The existing duty on cast iron pipe is 20 per cent. The House bill carried a duty of 30 per cent and this was continued by the Finance Committee.

In offering the amendment making sponge iron dutiable at 75c. a ton, Senator Barkley reserved the right to change the amendment when the bill gets to the Senate as a whole. He stated that if he was convinced of the accuracy of the statement of Senator Smoot, chairman of the Finance Committee, that a process for the manufacture of sponge iron is being worked out in the United States with prospects that a sponge iron industry will be built up in this country, the amendment might be changed. The implication was that a higher duty might be provided.

The duty on wire rods, valued at more than 4c. a lb., was reduced from 20 per cent to 6/10 of 1c. a lb., equivalent to about 11 per cent ad valorem.

The prevailing duty of 35 per cent on wire rope was restored by the Senate. The House bill had increased the duty to 40 per cent and the latter rate was continued by the Finance Committee.

Numerous reductions in duties were made on aluminum products by the Senate. On crude and scrap aluminum, the duty was reduced from 5c. to 2c. a lb.

Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Plates	2.90c.
Structural shapes.....	2.90c.
Soft steel bars and small shapes	2.80c. to 2.90c.
Reinforcing steel bars.....	2.75c.
Cold-finished and screw stock—	
Rounds and hexagons.....	3.60c.
Squares and flats.....	4.10c.
Bands	3.25c.
Hoops	4.25c.
Black sheets (No. 24), 25 or more bundles	3.60c.
Galv. sheets (No. 24), 25 or more bundles	4.25c.
Light plates, blue annealed (No. 10), 1 to 24 plates	3.25c.
Blue annealed sheets (No. 13), 1 to 24 sheets	3.40c.
Galv. corrug. sheets (No. 28), per square	4.13c.
Spikes, large	3.40c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Track bolts, all sizes, per 100 count, 60 per cent off list	
Machine bolts, 100 count, 60 per cent off list	
Carriage bolts, 100 count, 60 per cent off list	
Nuts, all styles, 100 count, 60 per cent off list	
Large rivets, base per 100 lb. \$3.50	
Wire, black, soft ann'l'd, base per 100 lb.	\$2.75 to 2.85
Wire, galv. soft, base per 100 lb.	3.20 to 3.30
Common wire nails, per keg. 2.60 to 2.75	
Cement coated nails, per keg 2.65 to 2.80	

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and under 10-in. Pittsburgh	\$33.00
Rerolling, 4-in. and under 10-in., Youngstown	33.00
Rerolling, 4-in. and under 10-in., Cleveland	33.00
Rerolling, 4-in. and under 10-in., Chicago	34.00
Forging quality, Pittsburgh	38.00

Sheet Bars

	(Open Hearth or Bessemer)	Per Gross Ton
Pittsburgh		\$33.00
Youngstown		33.00
Cleveland		33.00

Slabs

	(8 in. x 2 in. and under 10 in. x 10 in.)	Per Gross Ton
Pittsburgh		\$33.00
Youngstown		33.00
Cleveland		33.00

Skelp

	(F.o.b. Pittsburgh or Youngstown)	Per Lb.
Grooved		1.85c. to 1.90c.
Universal		1.85c. to 1.90c.
Sheared		1.85c. to 1.90c.

Wire Rods

	(Common soft, base)	Per Gross Ton
Pittsburgh		\$40.00
Cleveland		40.00
Chicago		41.00

Prices of Raw Material

Ores

	Lake Superior Ores, Delivered Lower Lake Ports	Per Gross Ton
Old range Bessemer, 51.50% iron		\$4.80
Old range non-Bessemer, 51.50% iron		4.65
Mesabi Bessemer, 51.50% iron		4.65
Mesabi non-Bessemer, 51.50% iron		4.50
High phosphorus, 51.50% iron		4.40
Foreign Ore, c.i.f. Philadelphia or Baltimore		Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algerian		12.00c.
Iron ore, low phos., Swedish, average 68% iron		12.00c.
Iron ore, basic Swedish, average 65% iron		10.00c.
Manganese ore, washed, 52% manganese, from the Caucasus		30.00c.
Manganese ore, Brazilian, African or Indian, basic 50%		30.00c.
Tungsten ore, high grade, per unit, in 60% concentrates		\$15.50 to \$16.50
Chrome ore, 45 to 50% Cr ₂ O ₃ , crude, c.i.f. Atlantic seaboard		\$22.00 to \$24.00
Molybdenum ore, 85% concentrates of MoS ₂ , delivered		50c. to 55c.

Ferromanganese

	Per Gross Ton
Domestic, 80%, seaboard	\$94.00 to \$99.00
Foreign, 80%, Atlantic or Gulf port, duty paid	94.00 to 99.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	\$31.00 to \$34.00
Domestic, 16 to 19%	29.00 to 32.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	\$83.50
75%	130.00
	Per Gross Ton Furnace
10%	\$35.00
11%	37.00
	Per Gross Ton Furnace
12%	\$39.00
14 to 16%	45.00

Bessemer Ferrosilicon

	F.o.b. Jackson County, Ohio, Furnace	Per Gross Ton
10%		\$30.00
11%		32.00
	Per Gross Ton	Per Gross Ton
10%		\$26.00 to \$28.00
7%		23.00 to 24.00
8%		24.00 to 25.00
9%		25.00 to 26.00

Silvery Iron

	F.o.b. Jackson County, Ohio, Furnace	Per Gross Ton
6%		\$22.00 to \$23.00
7%		23.00 to 24.00
8%		24.00 to 25.00
9%		25.00 to 26.00

Other Ferroalloys

Ferrotungsten, per lb. contained metal del'd	\$1.40 to \$1.50
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	11.00c.
Ferrovandium, per lb. contained vanadium, f.o.b. furnace	\$3.15 to \$3.65
Ferrocobaltititanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	\$160.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton	\$91.00
Ferrophosphorus, electric 24%, f.o.b. Aniston, Ala., per gross ton	\$122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silicon, gravel, f.o.b. Illinois and Kentucky mines	\$18.00
No. 2 lump, Illinois and Kentucky mines	20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid	\$18.25 to 18.75
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines	32.50

Fire Clay Brick

	Per 1000 f.o.b. Works
	High-Heat Intermediate Duty Brick Heavy Duty Brick
Pennsylvania	\$43.00 to \$46.00 \$35.00 to \$38.00
Maryland	43.00 to 46.00 35.00 to 38.00
New Jersey	50.00 to 65.00
Ohio	43.00 to 46.00 35.00 to 38.00
Kentucky	43.00 to 46.00 35.00 to 38.00
Missouri	43.00 to 46.00 35.00 to 38.00
Illinois	43.00 to 46.00 35.00 to 38.00
Ground fire clay, per ton	7.00

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	\$43.00
Chicago	52.00
Birmingham	50.00
Silica clay, per ton	\$8.50 to 10.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	\$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00
Standard size	45.00

Chrome Brick

	Per Net Ton
Standard size	\$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

	Per 100 Pieces
(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)	
	Per Cent Off List
Machine bolts	70
Carriage bolts	70
Lag bolts	70
Plow bolts, Nos. 1, 2, 3 and 7 heads	70
Hot-pressed nuts, blank or tapped, square	70
Hot-pressed nuts, blank or tapped, hexagons	70
C.p.c. and t. square or hex. nuts, blank or tapped	70
Washers*	7.00c. to 6.75c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.
†Bolts with rolled thread up to and including 1½ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagon nuts	70
Semi-finished hexagon castellated nuts, S.A.E.	70
Stove bolts in packages, P'gh.	75, 20, 10 and 5
Stove bolts in packages, Chicago	75, 20, 10 and 5
Stove bolts in packages, Cleveland	75, 20, 10 and 5
Stove bolts in bulk, P'gh.	75, 20, 10, 5 and 2½
Stove bolts in bulk, Chicago	75, 20, 10, 5 and 2½
Stove bolts in bulk, Cleveland	75, 20, 10, 5 and 2½
Tire bolts	60, 5 and 5

Discounts of 70 per cent off on bolts and nuts applied on carload business. For less than carload orders discounts of 55, 60 per cent apply.

Large Rivets

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	\$3.10
F.o.b. Chicago	3.20

Small Rivets

	(¾-in. and smaller)	Per Cent Off List
F.o.b. Pittsburgh		70 and 10
F.o.b. Cleveland		70 and 10
F.o.b. Chicago		70 and 10

Cap and Set Screws

	(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)	Per Cent Off List
Milled cap screws	80, 10 and 5	
Milled standard set screws, case hardened	80 and 5	
Milled headless set screws, cut thread	75 and 10	
Upset hex. head cap screws, U.S.S. thread	85 and 10	
Upset hex. cap screws, S.A.E. thread	85 and 10	
Upset set screws	80, 10 and 5	
Milled studs	70	

Chicago

New Steel Business Flattens Out but Specifications Support 90 Per Cent Operating Rate

CHICAGO, Feb. 18.—Although the Chicago iron and steel market, as viewed by sales and inquiries, shows a definite tendency to level off after several weeks of rapid strides upward, there seem to be no factors which portray easier demand in the near future. In fact, there are several directions in which larger use of steel is quite probable. Foremost among these is for building and bridge work. Fresh inquiries for structural steel for buildings show marked improvement at 20,000 tons, while awards are 6000 tons. Inquiries for storage tanks for use in oil fields amount to 10,000 tons, bringing the total of such business now before the trade to 30,000 tons.

A large sum of money is now available for public improvement work in Chicago and there is promise of more work of this kind following the collection of taxes which are being based on reassessment of real estate in Cook County.

Use of steel by manufacturers of automobiles has changed little in volume in the past week to 10 days. This situation is taken here to mean that production is being held closely to the rate of sales from showrooms. There is, however, a general belief that the opening of spring weather will see a more active demand by the public and that production of automobiles will turn upward, possibly as early as March 15.

Taken as a whole, specifications for finished steel amply support ingot operations. Sales, though in good volume, are not giving the market support as was the case earlier in the month. A fair estimate of ingot production for the district is the same as last week, 90 per cent.

Pig Iron.—Shipments of Northern foundry iron still point to a total tonnage for February that will exceed by a substantial margin the aggregate of deliveries in January. In fact, there is reason to believe that the margin will be wider than the 12 per cent estimate of a week ago. One merchant furnace has been out of blast for three weeks for relining and cannot be brought back into service until about April 1. In the meantime, with all other furnaces producing, demand is making it necessary to draw on furnace stocks, and it is not improbable that April will see stocks in the hands of producers of smaller size than in the fourth month a year ago. New business in silvery is quiet. Prevailing prices are commonly at the lower figure of the quoted spread. Southern iron is quiet from the viewpoint of sales in this territory. The most common quotation now is \$13 a ton, Birmingham.

Prices per gross ton at Chicago:

N'th'n No. 2 fdy., sil. 1.75 to 2.25...	\$20.00
N'th'n No. 1 fdy., sil. 2.25 to 2.75...	20.50
Malleable, not over 2.25 sil.	20.00
High phosphorus	20.00
Lake Super. charcoal, sil. 1.50....	27.04
S'th'n No. 2 fdy. (all rail).....	19.01
Low phos., sil. 1 to 2, copper free..	29.50
Silvery, sil. 8 per cent....	\$28.79 to 29.79
Bess, ferrosilicon, 14-15 per cent...	46.29

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Ferroalloys.—The recent announcement of a tonnage price schedule on ferromanganese has had no effect in bringing business into this market. Shipments of ferromanganese and other ferroalloys are of substantial size.

Plates.—Pending business in plates for oil storage tank construction continues to grow, with fresh inquiries this week reaching 10,000 tons. Business of this character now before the trade totals not less than 30,000 tons. Releases of plates for pipe line construction are still awaited. It has been reported that a large tonnage would soon be scheduled for rolling. There is much talk about gas lines that are projected for construction this year and in 1931. Although these projects are not yet tangible, steel men are watching developments closely. Of importance to the immediate Chicago territory is the report that the Empire Oil & Refining Co., which last year completed a large refinery in the South Chicago district, is contemplating enlargement of that unit and also will make additions to its refinery in Oklahoma. There is speculation here whether the planned addition to capacity at South Chicago will call for another pipe line or whether booster stations along existing lines will serve to increase the flow of oil. Although miscellaneous uses for plates continue to grow and now represent a sizable tonnage each week, the needs of the car builders are the most important. It is now fairly well established that only 4500 of the cars ordered by the Chesapeake & Ohio and subsidiaries will be built in Western shops. These will take about 65,000 tons of plates, shapes and bars. The Mount Vernon Car Mfg. Co. will build 500 cars for the Louisville & Nashville. Most Western car shops are comfortably fixed for several months. However, awards have not been as evenly distributed as some car builders would have liked, and these builders foresee curtailed output in the near future, especially in view of the limited amount of new business that is in sight from Western railroads. Prices for plates are generally 1.95c. a lb., Chicago, but concessions of \$1 a ton are occasionally being made.

Structural Material.—This market continues to gain strength both in Chicago and in a wide surrounding territory. Awards this week total 6000 tons, of which 2000 tons is for a new

Y. M. C. A. building in Chicago. Still more impressive are new projects on which figures are being taken and those which will come before the trade in the early spring. The railroads which use the Union Station in Chicago will buy 6800 tons for grade separation work. An addition to the Morrison Hotel, Chicago, will take 3000 to 4000 tons and a bank building at St. Paul, Minn., calls for 6000 tons. Close to 20,000 tons of new business is before the trade. A large part of \$25,000,000 is now available for construction of the outer bridge across the Chicago River and the extension of double-decked streets along the river. Construction will start in April on the Administration Building and one other World's Fair building. The Chicago Tribune is making final arrangements for a large addition to its tower building. Small inquiries and awards are more numerous in Chicago, and local shops are heartened somewhat by the change in the appearance of the market. However, it will take numerous contracts to fill the gap between the current rate of shop output and a rate that is anywhere near capacity.

Mill prices on plain material, per lb.: 1.95c. to 2.00c. base, Chicago.

Bars.—Demand for mild steel bars is steady from a wide circle of users. Specifications in the week were in ample aggregate size to support the current rate of output. Releases, which usually are arranged when purchases are made, are affording satisfactory rolling schedules, which are filled to the point where deliveries can be had only in accordance with well defined periods for roll changes. The forging industry is well engaged on miscellaneous orders. Orders from automobile manufacturers show that they are making an effort to hold production close to the point at which the public is taking cars from showroom floors. Specifications for alloy steel bars are in ample volume to support mill operations at 70 per cent of capacity. It is significant, however, that there has been practically no growth during the week in specifications from automobile manufacturers. This is taken by some to indicate close study of the retail sales of automobiles. It is contended that important enlargement of automobile output will not come before spring weather is at hand. The iron bar market is without feature. The dullness of the building situation, so far as it affects the use of reinforcing bars, and a slow season in the bed industry, are bearing adversely on the output of rail steel bars. Shipments of fence posts are heavier, but are well below the volume usually expected at this time of the year.

Rails and Track Supplies.—Chicago mills have booked about 15,000 tons of standard-section rails. This total represents the purchases of several small Western railroads. The Tennessee Coal, Iron & Railroad Co. is said to have taken 3000 tons of 100-lb. rails for the Seaboard Air Line. Although secondary buying is expected by the trade, it is too early in the year for this kind of business to develop. Sev-

eral orders for track supplies total 11,000 tons. Most of the large annual purchases are now out of the way, but there is still a sizable tonnage to be ordered by railroads which buy track fastenings for one quarter at a time. The light rail market is quiet.

Prices f.o.b. mill, per gross ton: Standard section open-hearth and Bess. rails, \$43; light rails, rolled from billets, \$36. *Per lb.:* Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 2.07½c. to 2.15c.; angle bars, 2.75c.

Cast Iron Pipe.—Activity in this market is at about the same level as a week ago. Small tonnages, both in the form of inquiries for prices and as orders, are somewhat more numerous. A few carload purchases have been made by the railroads. Although public-utility companies have already ordered rather freely, the trade looks to this source for additional business. The American Cast Iron Pipe Co. is said to have taken 400 tons of 6 to 12-in. pipe for Rochester, Minn., and 700 tons of 6 to 12-in. pipe for St. Paul, Minn. Minneapolis is opening bids this week on 400 tons of 24-in. pipe. Deliveries remain prompt on most sizes.

Prices per net ton, deliv'd Chicago: Water pipe, 6-in. and over, \$45.20 to \$46.20; 4-in., \$48.20 to \$49.20; Class A and gas pipe, \$3 extra.

Bolts, Nuts and Rivets.—Specifications for these commodities are spotty, but in the aggregate about equal to the volume a week ago. Demand is a trifle heavier from manufacturers of automobiles. Contracting for the second quarter will soon be under way in the more remote parts of the West. No word has been received here as to contemplated changes in discounts.

Coke.—Shipments of by-product foundry coke remain heavy and at the full capacity of local ovens. Due to heavy contracts placed for the half year, current sales are light at prices which are stable at \$8 a ton, local ovens.

Old Material.—The Chicago scrap iron and steel market continues to gain strength as sales to consumers grow more numerous. A large tonnage of heavy melting steel has been

taken by a local mill at \$14 a gross ton, delivered, and dealers already have in mind asking still higher prices on tonnages which they expect to sell in the near future. Cast iron wheels are moving freely in small lots at \$15.50 a gross ton, delivered, and agricultural malleable, which is in sharp demand, is up \$1 a ton. Quotations on borings are strong and this grade brings \$10.40 on dealers' trades. Local yards are by no means heavily stocked and little scrap is moving into Chicago from country yards. The bulk of current supplies is coming from the railroads and industrial plants. The use of steel foundry grades indicates this industry is spotty, but is gradually working to higher levels of output. The Rock Island is offering a list of 5000 tons and the Chicago & Alton will dispose of a small list.

Prices deliv'd Chicago district consumers:
Per Gross Ton

Basic Open-Hearth Grades:	
Heavy melting steel.....	\$13.50 to \$14.00
Shoveling steel	13.50 to 14.00
Frogs, switches and guards, cut apart, and misc. rails	14.00 to 14.50
Hydraul. compressed sheets	12.50 to 13.00
Drop forge flashings.....	9.75 to 10.25
No. 1 busheling	11.00 to 11.50
Forg'd cast and r'd steel carwheels	18.50 to 19.00
Railroad tires, charg. box size	17.75 to 18.25
Railroad leaf springs cut apart	17.50 to 18.00
Acid Open-Hearth Grades:	
Steel couplers and knuckles	16.00 to 16.50
Coil springs	18.25 to 18.75
Electric Furnace Grades:	
Axle turnings	13.00 to 13.50
Low phos. punchings.....	15.75 to 16.25
Low phos. plates, 12 in. and under	15.75 to 16.25
Blast Furnace Grades:	
Axle turnings	10.75 to 11.25
Cast iron borings.....	10.25 to 10.75
Short shoveling turnings..	10.25 to 10.75
Machine shop turnings....	7.75 to 8.25
Rolling Mill Grades:	
Iron rails	14.50 to 15.00
Rerolling rails	15.00 to 15.50
Cupola Grades:	
Steel rails less than 3 ft...	17.25 to 17.75
Steel rails less than 2 ft...	18.75 to 19.25
Angle bars, steel.....	15.75 to 16.25
Cast iron carwheels.....	15.00 to 15.50
Malleable Grades:	
Railroad	17.00 to 17.50
Agricultural	15.50 to 16.00
Miscellaneous:	
*Relaying rails, 56 to 60 lb.	23.00 to 25.00
*Relaying rails, 65 lb. and heav.	26.00 to 31.00

Per Net Ton

Rolling Mill Grades:	
Iron angle and splice bars	15.00 to 15.50
Iron arch bars and transoms	17.50 to 18.00
Iron car axles	25.50 to 26.00
Steel car axles.....	16.75 to 17.25
No. 1 railroad wrought...	12.25 to 12.75
No. 2 railroad wrought...	12.00 to 12.50
No. 1 busheling	9.00 to 9.50
No. 2 busheling	7.25 to 7.75
Locomotive tires, smooth..	14.50 to 15.00
Pipes and flues	9.50 to 10.00
Cupola Grades:	
No. 1 machinery cast.....	14.00 to 14.50
No. 1 railroad cast.....	13.50 to 14.00
No. 1 agricultural cast....	12.00 to 12.50
Stove plate	11.00 to 11.50
Grate bars	11.00 to 11.50
Brake shoes	11.00 to 11.50

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

Wire Products.—This week brought some improvement in the movement of manufacturers' wire, especially in the East. Use of this commodity is in moderate tonnage by manufacturers of automobiles, who are closely matching output with the sales of cars to the public. Distribution of jobbers

is still slow, but the nearness of spring weather raises the hopes of producers that orders from this source will grow. Output by wire mills stands at 55 per cent, which is below normal for this time of the year. While irregularities in prices are still to be found, the general tendency is for the structure to become more stable.

Sheets.—Prices for sheets are unchanged, but several producers are considering making efforts to advance quotations about \$2 a ton. The size of books and the general character of business might not lend support to such a move, but, as one seller points out, the margin of profit at current levels is extremely narrow and larger books can be expected when spring weather will permit heavier consumption of sheets for roofing and related uses as well as for light tanks. Output has been raised several points to 75 per cent of capacity, but orders are small and for immediate consumption and mills are scheduled only a few days in advance. Distribution by jobbers, though heavier than in January, is lighter than in the second month of last year.

Base prices per lb., deliv'd from mill in Chicago: No. 24 black sheets, 2.80c. to 2.90c.; No. 24 galv., 3.45c. to 3.55c.; No. 10 blue ann'l'd, 2.35c. Deliv'd prices at other Western points are equal to the freight from Gary, plus the mill prices, which are 5c. per 100 lb. lower than Chicago delivered prices.

Reinforcing Bars.—Activity in this market is almost wholly confined to small lots, on which recently published prices are holding. Most dealers also have published quotations on large tonnages, but the market has been so quiet that tests have not been made. It is said that new industrial work is in prospect. It is reported from Springfield, Ill., that the 1930 State highway program will be large and that construction will soon be under way. The trade is looking forward to bidding on tonnages for the World's Fair buildings; construction of several may be put under way in April. Output of bending shops is drifting to lower levels as new business fails to support operations at a rate which is below normal for this time of the year.

Detroit Scrap Unchanged

DETROIT, Feb. 18.—There have been no changes in prices on old material in this district during the past week. Price declines of a week ago are reflected in the quotations below.

Dealers' buying prices per gross ton, f.o.b. cars, Detroit:

Hvy. melting and shov. steel	\$12.00 to \$12.50
Borings and short turnings	9.00 to 9.50
Long turnings	8.00 to 8.50
No. 1 machinery cast.....	11.25 to 11.75
Automotive cast	12.00 to 13.00
Hydraul. comp. sheets....	11.75 to 12.25
Stove plate	9.00 to 9.50
New No. 1 busheling.....	11.00 to 11.50
Old No. 1 busheling.....	8.75 to 9.25
Sheet clippings	9.00 to 9.50
Flashings	11.00 to 11.50

Youngstown Sheet & Tube Co. has moved its Cleveland office from the Union Trust Building to 2400 Terminal Tower Building.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes.....	3.10c.
Soft steel bars.....	3.00c.
Reinforc'g bars, billet steel—	
Under 5 tons	2.85c.
5 tons to 30 tons	2.45c.
30 tons and over.....	2.00c.
Rail steel reinforcement.....	1.75c.
Cold-fin. steel bars and shafting—	
Rounds and hexagons.....	3.60c.
Flats and squares	4.10c.
Bands (½ in. in Nos. 10 and 12 gages)	3.20c.
Hoops (No. 14 gage and lighter)...	3.75c.
Black sheets (No. 24).....	4.05c.
Galv. sheets (No. 24).....	4.60c.
Blue ann'l'd sheets (No. 10)....	3.35c.
Spikes, ½ in. and larger.....	3.55c.
Track bolts	4.55c.
Rivets, structural	4.00c.
Rivets, boiler.....	4.00c.
Per Cent Off List	
Machine bolts	60
Carriage bolts	60
Coach or lag screws	60
Hot-pressed nuts, sq., tap, or blank..	60
Hot-pressed nuts, hex., tap, or blank..	60
No. 8 black ann'l'd wire, per 100 lb.	\$3.45
Com. wire nails, base per keg.	\$2.85 to 2.95
Cement c'd nails, base per keg	2.85 to 2.95

New York

Pig Iron Demands Still Spotty—Steel Sales Less Active, With Prices Slightly Firmer

NEW YORK, Feb. 18.—Pig iron sales, at 8000 tons, were of average proportions, although 1500 tons smaller than in the previous week. Demand is still spotty, reflecting the uneven operations among foundries. Melt appears to be slowly improving, but probably does not average much more than 60 per cent of capacity. Pig iron shipments show the same irregularity that prevails in the foundry trade. Some sellers are delivering less iron than in January, while others report that shipments are holding their own or have improved. The caution of melters is indicated by the prevalence of hand-to-mouth buying. The propensity is to buy in smaller lots and oftener than usual. Prices have shown no further changes, being described by sellers as "flat on their backs." Southern foundry iron continues to be a competitive factor, being quoted at \$18.50, on dock, New York harbor. Last week 1700 tons of Alabama iron arrived in this port, consigned to a pig iron seller. The Thatcher Co., Newark, N. J., is inquiring for 1000 to 1500 tons of foundry iron and the Ingersoll-Rand Co. is in the market for 1000 tons for Painted Post, N. Y., and 100 tons for Phillipsburg, N. J. The General Fire Extinguisher Co., Providence, R. I., has bought 3000 tons.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil.	1.75 to 2.25	\$20.91 to \$21.41
*Buff. No. 2, del'd east.		
N. J.	19.28 to 19.78	
East. Pa. No. 2 fdy., sil.	1.75 to 2.25	19.89 to 21.02
East. Pa. No. 2X fdy., sil.	2.25 to 2.75	20.49 to 21.52

Freight rates: \$4.91 from Buffalo, \$1.39 to \$2.52 from eastern Pennsylvania.

*Prices delivered to New Jersey cities having rate of \$3.28 a ton from Buffalo.

Finished Steel.—Aside from a fairly active structural steel market, there has been a lesser degree of activity in the local steel demand during the past week. Some general consumers seem to have satisfied their requirements for the time being. Railroad requisitions, especially for plates, have been in somewhat better volume. The price situation shows signs of strengthening. The Eastern plate mills are adopting a firm stand, one or two declining to take business at less than 1.95c., Coatesville, or 2.12½c., New York. The general market on plates appears to be 2.07½c. to 2.12½c., New York, but some old quotations at lower prices are still out and serve to disturb the situation. Some of the sheet mills are declining to take orders at less than 2.65c., Pittsburgh, for black sheets, 3.30c. for galvanized and 2.10c. and 2.35c. for the blue annealed jobbing mill products, No. 10 and No. 13 respectively. The Harris Structural Steel Co. will fabricate 11,000 tons for the building to be erected at Thirty-

eighth to Thirty-ninth Street on Broadway.

Mill prices per lb., deliv'd New York: Soft steel bars, 2.19c. to 2.24c.; plates, 2.07½c. to 2.12½c.; structural shapes, 2.04½c. to 2.14½c.

Cast Iron Pipe.—Pressure pipe prices continue firm at about \$36 a ton, f.o.b. Northern foundry. Erie, Pa., has awarded about 500 tons of 4 to 20-in. and 700 tons of 24-in. water pipe to James B. Clow & Sons. E. L. Phillips & Co., New York, have placed part of a small tonnage of gas pipe recently inquired for to supply a Long Island utility. New York has not yet asked for bids on pipe, but is expected to be in the market shortly for a substantial tonnage.

Prices per net ton deliv'd New York: Water pipe, 6-in. and larger, \$38.60; 4-in. and 5-in., \$41.60; 3-in., \$48.60. Class A and gas pipe, \$3 extra.

Old Material.—Prices of all grades of scrap are generally unchanged on the basis of recent small sales. A Claymont, Del., consumer of No. 1 heavy melting steel has closed for 2000 to 3000 tons at \$14.50 a ton, delivered, and some small lots of heavy breakable cast have been sold to eastern Pennsylvania consumers at \$14.50 a ton, delivered. Dealers shipping stove plate to local foundry users are quoting \$10.75 to \$11 a ton, delivered, about 50c. a ton more than they were recently willing to pay for the same delivery.

Dealers' buying prices per gross ton, f.o.b. New York:

No. 1 heavy melting steel	\$10.50 to \$11.35
Heavy melting steel (yard)	7.50 to 8.00
No. 1 hvy. breakable cast	9.75 to 10.25
Stove plate (steel works)	8.00
Locomotive grate bars	8.25
Machine shop turnings	7.00 to 7.50
Short shoveling turnings	7.25 to 7.50
Cast borings (blast fur.	
or steel works)	7.00 to 7.50
Mixed borings and turnings	6.75 to 7.50
Steel car axles	15.25 to 16.25
Iron car axles	20.50 to 21.00
Iron and steel pipe (1 in.	
dia., not under 2 ft. long)	9.25 to 9.75
Forge fire	8.50 to 9.00
No. 1 railroad wrought	11.50 to 12.50
No. 1 yard wrought, long	10.50 to 11.50
Rails for rolling	10.50 to 11.00
Stove plate (foundry)	8.75 to 9.00
Malleable cast (railroad)	12.50 to 13.00
Cast borings (chemical)	8.50 to 9.50

Prices per gross ton, deliv'd local foundries:

No. 1 machry. cast	\$15.00
No. 1 hvy. cast (columns, bldg. materials, etc.), cupola size	13.00
No. 2 cast (radiators, cast boilers, etc.)	12.50

Warehouse Business.—Buying from stock continues irregular, a few active days being followed by dullness. The month, however, is expected to compare favorably with January, although it is short and contains two holidays. Prices are fairly well maintained except for continued shading on black, galvanized and blue annealed sheets.

Reinforcing Bars.—An inquiry for 450 tons for a State hospital on Long Island and awards of 650 and 700 tons, one for a bank building in New

York and the other for a bridge in Newark, comprised the chief activity in the metropolitan district. Prices are quoted at 1.85c. in mill lengths and 2.10c. for cut lengths, Pittsburgh.

Coke.—Furnace coke prices are unchanged at \$2.65 to \$2.75 a net ton, Connellsville, but distress carloads are not being so freely offered as a week or more ago, so that the market shows

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes	3.30c.
Soft steel bars, small shapes	3.25c.
Iron bars	3.24c.
Iron bars, Swed. charcoal	7.00c. to 7.25c.
Cold-fin. shafting and screw stock—	
Rounds and hexagons	3.40c.
Flats and squares	3.90c.
Cold-roll strip, soft and quarter	
hard	5.05c.
Hoops	4.25c.
Bands	3.75c.
Blue ann'd sheets (No. 10)	3.25c. to 3.90c.
Long terme sheets (No. 24)	5.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galv. annealed	5.15c.
Tire steel, ½ x ½ in. and larger	3.40c.
Smooth finish, 1 to 2 ½ x ¼ in.	
and larger	3.75c.
Open-hearth spring steel, bases,	4.50c. to 7.00c.
	Per Cent
Machine bolts, cut threads:	Off List
¾ x 6 in. and smaller	60
1 x 30 in. and smaller	.50 to 50 and 10
Carriage bolts, cut thread:	
¾ x 6 in. and smaller	60
¾ x 20 in. and smaller	.50 to 50 and 10
Coach Screws:	
¾ x 6 in. and smaller	60
1 x 6 in. and smaller	.50 to 50 and 10
Boiler Tubes—	Per 100 Ft.
Lap welded, 2-in.	\$19.00
Seamless steel, 2-in.	20.25
Charcoal iron, 2-in.	26.25
Charcoal iron, 4-in.	67.00

Discounts on Welded Pipe

Standard Steel—	Black	Galv.
¾-in. butt.	46	29
¾-in. butt.	51	37
1-3-in. butt.	53	39
2 ½-6-in. lap.	48	35
7 and 8-in. lap.	44	17
11 and 12-in. lap.	37	12

Wrought Iron—

¾-in. butt.	5	+19
¾-in. butt.	11	+9
1-1 ½-in. butt.	14	+6
2-in. lap.	5	+14
3-6-in. lap.	11	+6
7-12-in. lap.	3	+16

Tin Plate (14 x 20 in.)

	Prime	Seconds
Coke, 100 lb. base box	\$6.45	\$6.20
Charcoal, per Box—	A	AAA
IC	\$9.70	\$12.10
IX	12.00	14.25
IXX	13.90	16.00

Terne Plate (14 x 20 in.)

IC—20-lb. coating	\$10.00 to \$11.00
IC—30-lb. coating	12.00 to 13.00
IC—40-lb. coating	13.75 to 14.25

Sheets, Box Annealed—Black, C. R.

	One Pass	Per Lb.
Nos. 18 to 20	3.60c. to 3.70c.	
No. 22	3.75c. to 3.85c.	
No. 24	3.80c. to 3.90c.	
No. 26	3.90c. to 4.00c.	
No. 28	4.05c. to 4.15c.	
No. 30	4.30c. to 4.40c.	

Sheets, Galvanized

	Per Lb.
No. 14	4.00c. to 4.15c.
No. 16	3.85c. to 4.00c.
No. 18	4.00c. to 4.15c.
No. 20	4.10c. to 4.25c.
No. 22	4.20c. to 4.35c.
No. 24	4.35c. to 4.50c.
No. 26	4.60c. to 4.75c.
No. 28	4.85c. to 5.00c.
No. 30	5.25c. to 5.40c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

†For 50 bundles or more, 25c. per 100 lb. or less.

more firmness. Special brands of beehive foundry coke are \$4.85 a net ton, ovens, or \$8.56, delivered to northern New Jersey, Jersey City and Newark,

and \$9.44 to New York and Brooklyn. By-product coke is quoted at \$9 to \$9.40 a net ton, Newark or Jersey City; \$10.06, New York or Brooklyn.

Cleveland

Lull in Demands for Sheets and Strips From Automobile Industry—Mill Operations Are Maintained

CLEVELAND, Feb. 18.—Demand for finished steel, which has shown a gradual increase for several weeks, developed a slight downward tendency in sheets and strip steel during the past week. Steel bars continue to move in fairly good volume at about the recent rate, and orders for shapes and plates show little change. The decline in sheet and strip business, mostly from the automotive industry, seems due to the fact that buyers are well covered for their early requirements. It is expected that after a short lull there will be a revival in specifications and new business. Motor car manufacturers, aside from the Ford and Chevrolet companies, are showing a very cautious policy in buying steel and increasing production, and their February output is expected to show only a little gain over January.

While the Ford company is now on a 6000 unit per day schedule, this is the number of motors produced, and this company is understood to be turning out 8750 units a day at its various assembly plants. All automobile companies are stocking up their dealers, but it will be some time before the spring buying by car users gets well under way, and until sales give some indication of the volume of spring buying motor car builders are not expected to make much change in present production schedules.

Mills are fairly well supplied with orders, but do not have much backlog tonnage. Most of the sheet mills have enough business to keep them going at present operations for about two weeks. Mills in this territory are maintaining recent operations.

Prices are holding at recent levels. Large lot buyers in the Detroit territory are able to get concessions on some products, but no more than recently. There has been some pressure for concessions on alloy steel bars, but this has been resisted.

Iron Ore.—That last year's prices on Lake Superior ore will be reestablished for this year is the belief of representatives of some of the Cleveland ore firms. While some inquiry about prices has come from consumers, it is not expected that much interest will be shown in the market for some time. Last year a price advance of 25c. a ton was made, this having been the first price change on Lake Superior ore in four years. Owing to the slowing down of the iron and steel industry late in the year, quite a few consumers have larger stocks in their furnace yards than they would normally be carrying at the present time, not having anticipated in their ore shipping schedules their curtailed pig iron production. Because of this, a late opening of the buying season and a light early season ore movement are expected.

Pig Iron.—Sales again declined slightly the past week, during which Cleveland interests sold 18,600 tons of foundry and malleable iron, mostly

in small lots. Most foundries that are not under contract for the current quarter are adhering to the policy of buying from month to month, and there is no indication that they will change their attitude in making their second quarter purchases. Aside from the shading of differentials, prices continue fairly firm. Cleveland furnaces are holding rather closely to \$18.50, furnace, for foundry and malleable iron for outside shipment and are not seeking business in competitive territories where they would have to go under \$18. For local delivery the market is firm at \$19, furnace. In Michigan there is a range from \$19.50 to \$20. In northern Indiana \$19.50 is the prevailing price. Shipments show a slight gain from week to week. Jobbing foundries in this territory are operating slightly better than a few weeks ago.

Prices per gross ton at Cleveland:

N'th'n fdy., sil. 1.75 to 2.25	\$19.50
S'th'n fdy., sil. 1.75 to 2.25	19.51
Malleable	19.50
Ohio silvery, 8 per cent....	28.00
Basic Valley furnace.....	18.50
Stand. low phos., Valley....	\$26.50 to 27.00

Prices except on basic and low phosphorus are delivered Cleveland. Freight rates: 50c. from local furnaces; \$3 from Jackson, Ohio; \$6.01 from Birmingham.

Bars, Plates and Shapes.—Demand for steel bars continues good. While most of the tonnage is coming from the automotive industry, there is a fair scattering demand from other consumers. Alloy steel bars are very active, but mills have not accumulated much

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and struc. shapes.....	3.00c.
Soft steel bars.....	3.00c.
Reinforc. steel bars.....	2.25c. to 2.50c.
Cold-fin. rounds and hex.....	3.65c.
Cold-fin. flats and sq.....	4.15c.
Hoops and bands, No. 12 to 1/4 in., inclusive	3.25c.
Hoops and bands, No. 13 and lighter	3.65c.
Cold-finished strip	5.95c.
Black sheets (No. 24).....	3.75c.
Galvanized sheets (No. 24).....	4.50c.
Blue ann'd sheets (No. 10).....	3.25c.
No. 9 ann'd wire, per 100 lb.....	\$2.75
No. 9 galv. wire, per 100 lb.....	3.20
Com. wire nails, base per keg.....	2.65

*Net base, including boxing and cutting to length.

backlog. Structural shapes are moving fairly well to fabricators and crane and shovel builders. Very little building work is coming out. A large amount of highway bridge work is in prospect in Ohio, New York and Pennsylvania. Mills are getting a fair number of small-lot plate orders, but the aggregate tonnage is not large. Many of the tank shops are in need of orders. Steel bars are firm at 1.85c., Cleveland, for this territory. However, there are still reports of a 1.80c. price being named for some outside consuming points. Plates and shapes are well maintained at 1.85c., Pittsburgh.

Sheets.—Sales and specifications declined during the week. The only explanation for the falling off is that many consumers in the automotive field have ordered about all the steel they require for early needs and will wait until they get part of it worked up before making additional purchases. Stove makers and some other consumers outside the automotive field are still rather quiet. No orders came out during the week in large enough lots to test prices. The market has a firmer tone on black sheets, on which 2.65c. appears well maintained in this territory. Jobbing mills quote blue annealed sheets at 2.10c. for No. 10 and 2.25c. for No. 13, deviations from these prices being reported only on material in widths and gages for which continuous mills compete. On galvanized sheets, 3.30c. is rather commonly quoted. On metal furniture sheets, 3.90c. has become more general. Automobile body sheets are firm at 3.90c.

Railroad Equipment.—The Wheeling & Lake Erie Railroad has placed 1000 tons of rails with a Pittsburgh district mill, this being only part of its season's requirements. Car shops are starting to place specialties for the freight cars recently bought by the Chesapeake & Ohio and allied railroads. Specifications include 64,000 cast iron and 26,000 wrought steel wheels.

Semi-Finished Steel.—Shipments are holding up to recent levels, and the leading local producer has acquired a fair backlog. The market appears firm at \$33, Cleveland and Youngstown, for sheet bars, billets and slabs. Shipments against contracts are being made at that price.

Strip Steel.—Specifications for both hot and cold-rolled strip steel fell off the past week. Consumers have been ordering fairly freely for early needs and appear to have enough material in stock or on order to take care of present requirements. Demand so far this year has not shown much pick-up from industries outside of the automotive field, although cold-rolled strip in narrow material is moving fairly well. Prices are steady at 1.80c., Pittsburgh, for wide strip and 1.90c. for narrow and 2.65c., Cleveland, for cold-rolled strip.

Coke.—Shipping orders for foundry coke are slightly better than recently, but new demand is rather quiet. Prices are steady at recent quotations. Ohio by-product foundry coke is quoted at

\$8.25, ovens. There is not much activity in by-product coke for domestic heating purposes.

Old Material.—The market is moderately active and firm. Additional small lots of heavy melting steel have been purchased by a Cleveland mill at \$14.90, and dealers are paying \$14.50 to \$14.60 for this grade, being able to get the higher prices for shipment to the Valley district, or \$16.50, delivered. One local mill is reported to have paid as high as \$16 for selected heavy melting steel scrap. Mills continue to take scrap in fairly liberal quantities, and dealers are paying quoted prices for scrap to fill outstanding orders. The only price change is a 25c. a ton advance on machine shop turnings.

Prices per gross ton delivered consumers' yards:

Basic Open-Hearth Grades:		
No. 1 heavy melting steel..	\$14.00 to	\$14.50
No. 2 heavy melting steel..	13.25 to	13.75
Compressed sheet steel....	13.00 to	13.50
Light bundled sheet stampings	11.50 to	12.00
Drop forge flashings.....	12.00 to	12.50
Machine shop turnings....	10.50 to	11.00
Short shoveling turnings..	11.50 to	12.00
No. 1 railroad wrought....	13.00 to	13.50
No. 2 railroad wrought....	14.00 to	14.50
No. 1 busheling.....	12.00 to	12.50
Pipes and flues.....	9.00 to	9.50
Steel axle turnings.....	12.50 to	13.00
Acid Open-Hearth Grades:		
Low phos., forging crops..	17.75 to	18.00
Low phos., billet bloom and slab crops.....	18.50 to	18.75
Low phos., sheet bar crops	18.00 to	18.50
Low phos., plate scrap....	18.00 to	18.50
Blast Furnace Grades:		
Cast iron borings.....	10.50 to	11.00
Mixed borings and short turnings	10.50 to	11.00
No. 2 busheling.....	10.00 to	10.50
Cupola Grades:		
No. 1 cast.....	15.25 to	15.75
Railroad grate bars.....	11.00 to	12.00
Stove plate.....	12.00 to	12.50
Rails under 3 ft.....	18.50 to	19.50
Miscellaneous:		
Railroad malleable	18.00 to	18.50
Rails for rolling.....	16.25 to	16.50

The Detroit district sales office of Cutler-Hammer, Inc., Milwaukee, electric control apparatus, was located at 2755 East Grand Boulevard on Feb. 10. The new location includes warehouse facilities, where stocks of standard C-H motor control, wiring devices, safety switches and other products will be carried for immediate delivery.

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier.....	2.70c.
Plates, ⅜-in.	2.90c.
Structural shapes	2.70c.
Soft steel bars, small shapes, iron bars (except bands).....	2.80c.
Round-edge iron	3.50c.
Round-edge steel, iron finished 1½ x 1½ in.	3.50c.
Round-edge steel planished.....	4.30c.
Reinforc. steel bars, sq., twisted and deform.....	2.60c. to 2.80c.
Cold-fin. steel, rounds and hex....	3.40c.
Cold-fin. steel, sq. and flats.....	3.90c.
Steel hoops	3.55c.
Steel bands, No. 12 to ⅜-in. inclus.	3.30c.
Spring steel	5.00c.
*Black sheets (No. 24).....	3.80c.
†Galvanized sheets (No. 24).....	4.45c.
Light plates, blue annealed (No. 10)	3.25c.
Blue ann'd sheets (No. 13).....	3.40c.
Diam. pat. floor plates—	
¼-in.	5.30c.
⅜-in.	5.50c.
Rails	3.20c.
Swedish iron bars.....	6.60c.

*For 50 bundles or more; 10 to 49 bun., 4.10c. base; 1 to 9 bun., 4.35c. base.
†For 50 bundles or more; 10 to 49 bun., 4.95c. base; 1 to 9 bun., 5.30c. base.

Philadelphia

Steel Buying Declines But Price Concessions Are Less Common—Pig Iron Competition Severe

PHILADELPHIA, Feb. 18.—The improvement in steel buying in the second half of January and early this month has not been maintained, and the past week brought little new tonnage to mill books. Prices are slightly more stable than during the period of active buying, but are still subject to some concessions when substantial tonnage is involved. Although concessions are still granted to large buyers of blue annealed and black sheets, these usually do not exceed \$1 a ton and are less common than a fortnight ago.

Affected by competition from furnaces in other districts, especially the South, eastern Pennsylvania pig iron prices are lacking in strength. Users of basic iron manifest interest in purchasing, but, with Birmingham iron available at about \$18.75 a ton, delivered, are seeking concessions in the eastern Pennsylvania basic price.

Pig Iron.—Eastern Pennsylvania has become a highly competitive territory, in which local producers are endeavoring to obtain business in competition with furnaces to the north and south. On tonnages of ordinary size, eastern Pennsylvania sellers usually obtain \$20 a ton, furnace, but when large and desirable contracts are offered, Birmingham or Buffalo competition at times necessitates concessions or loss of the business. About 1000 tons of foundry iron for the Arundel Mfg. Co., Camden, N. J., was placed with an eastern Pennsylvania steel company furnace despite competition from Birmingham sellers. The Ingersoll-Rand Co. is in the market for about 100 tons of foundry iron for Phillipsburg, N. J. A Delaware River cast iron pipe maker has closed on about 10,000 tons of foundry iron for water delivery from a furnace to the north at a reported price of \$19.25 a ton, delivered. About 3000 tons of foundry iron bought by a Baltimore consumer last week at a price reported to have been \$19.90 a ton, delivered, was actually closed at a price appreciably higher. Demand for low phosphorus iron continues fair, with an inquiry in the market from the General Steel Castings Co., Eddystone, Pa., for about 1000 tons. Seaboard furnaces, which supply most of their iron ore requirements abroad, have recently experienced a rather severe shortage of ore, with foreign deliveries on contracts decidedly poor.

Prices per gross ton at Philadelphia:

East. Pa. No. 2, 1.75 to 2.25 sil.	\$20.76 to \$21.76
East. Pa. No. 2X, 2.25 to 2.75 sil.	21.26 to 22.26
East. Pa. No. 1X.....	21.72 to 22.76
Basic (del'd east. Pa.)....	19.50
Malleable	21.25 to 21.75
Stand. low phos. (f.o.b. east. Pa. furnace).....	24.00
Cop. b'r'g low phos. (f.o.b. furnace)	23.00 to 24.00
Va. No. 2 plain, 1.75 to 2.25 sil.	22.29
Va. No. 2X, 2.25 to 2.75 sil.	22.79

Prices, except as specified otherwise, are deliv'd Philadelphia. Freight rates: 76c. to \$1.64 from eastern Pennsylvania furnaces; \$4.54 from Virginia furnaces.

Billets.—Buying is limited to small lots, as most users are fairly well supplied. Re-rolling billets have been sold at \$33 a ton, Pittsburgh, but on forging quality \$39 a ton, Pittsburgh, is obtainable.

Bars.—Business is limited to small

lots and, although 1.90c. a lb., Pittsburgh, or 2.22c., delivered Philadelphia, is obtained on certain specifications, 1.85c., Pittsburgh, or 2.17c., delivered Philadelphia, is more representative of the present market.

Reinforcing Bars.—Competition for business is keen, and on sizable requirements billet steel bars have recently been quoted at 1.90c. a lb., Pittsburgh, or 2.22c., delivered Philadelphia, without the usual extra for cutting to length. On ordinary tonnages, the market is 1.95c., Pittsburgh, or 2.27c., delivered Philadelphia. Rail steel bars range from 1.75c. to 1.80c., Franklin, Pa., and Tonawanda, N. Y., or 2.07c. to 2.12c., delivered Philadelphia, with no extra for cutting to length. Projects requiring reinforcing bars include 1500 tons for the Hoyt Street sewer in Philadelphia and 200 tons in a State road sewer, also in Philadelphia. The Pennsylvania Department of Highways has opened bids on county road contracts, which will require a fair total of reinforcing steel.

Shapes.—Not much new tonnage is being booked by mills to replace current shipments. Prices show no change except for a continued trend toward the minimum quotation for all classes of contracts, large and small. Quotations range from 1.80c. to 1.85c. a lb., f.o.b. nearest mill to consumer, or 1.86c. to 1.91c., delivered Philadelphia. Occasionally the minimum price is shaded on desirable orders.

Plates.—Eastern Pennsylvania mills are endeavoring to maintain the market at 1.90c. to 1.95c., Coatesville, Pa., or 2c. to 2.05c., delivered Philadelphia, but desirable specifications occasionally bring a slight concession. Only a small tonnage of new business has been entered on mill books recently, so that buying by shipyards is awaited as an important factor in improved operations.

Sheets.—Buying is limited, but prices are being maintained with more firmness than a fortnight and more ago. Black sheets are quoted at 2.65c. a lb., Pittsburgh, or 2.97c., delivered Philadelphia, and only large and desirable business brings a concession of \$1 a ton, although on high finished sheets 2.55c., Pittsburgh, is still occasionally used as the base.

Galvanized sheets are inactive, with the price firm at 3.30c., Pittsburgh, or 3.62c., delivered Philadelphia. Blue annealed sheets are 2.20c., Pittsburgh, or 2.52c., delivered Philadelphia, for No. 13 gage, and blue annealed plates are 2.10c., Pittsburgh, or 2.42c., delivered Philadelphia, for No. 10 gage. The market on hot-rolled strip steel lacks strength, and on recent business with automobile body builders 1.75c., base Pittsburgh, has been quoted.

Imports.—In the week ended Feb. 15, arrivals at this port consisted of 546 tons of pig iron from British India, 50 tons of iron ore from the United Kingdom, 35 tons of steel bands from Germany and 27 tons of iron bars from Sweden.

Old Material.—Scrap buying is still confined to small tonnages, with buyers seeking lower than current prices and dealers unwilling to enter into commitments at prices that might prove unprofitable. On some recent small purchases of No. 2 heavy melting steel at \$11.50 a ton, delivered Pottsville, Pa., brokers have found it necessary to pay \$11.50 a ton to obtain material.

Prices per gross ton delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel.....	\$14.50
Scrap T rails.....	14.00
No. 2 heavy melting steel.....	\$11.50 to 13.00
No. 1 railroad wrought.....	15.00 to 15.50
Bundled sheets (for steel works).....	11.50
Hydraulic compressed, new	
Hydraulic compressed, old.....	12.00 to 12.50
Machine shop turnings (for steel works).....	11.00
Heavy axle turnings (or equiv.).....	12.50 to 13.00
Cast borings (for steel works and roll. mill).....	11.00
Heavy breakable cast (for steel works).....	13.50 to 14.00
Railroad grate bars.....	11.00 to 11.50
Stove plate (for steel works).....	11.50 to 12.50
No. 1 low phos. hvy., 0.04% and under.....	20.50 to 21.50
Couplers and knuckles.....	19.00 to 19.50
Rolled steel wheels.....	19.00 to 19.50
No. 1 blast furnace scrap.....	10.50 to 11.00
Wrot. iron and soft steel pipes and tubes (new specific.).....	14.00
Shafting.....	19.00
Steel axles.....	20.00 to 21.00
No. 1 forge fire.....	13.00 to 13.50
Cast iron carwheels.....	15.00
No. 1 cast.....	15.00 to 15.50
Cast borings (for chem. plant).....	14.00 to 14.50
Steel rails for rolling.....	15.00 to 15.50

Sivyer Acquires Nugent Steel Castings Company

The Sivyer Steel Casting Co., Milwaukee, manufacturer of carbon and alloy steel castings, on Feb. 14 announced the acquisition of the Nugent Steel Castings Co., Chicago, producer of similar products. Both businesses will be conducted under the Sivyer name.

To complete the transaction, the Sivyer company is offering to the public 20,000 shares of no par value stock, which will result in 80,000 shares being outstanding out of the total authorized 100,000 shares. Annual net earnings for the last five years of the two concerns were equivalent to \$4.22 per share of common stock to be outstanding.

The acquisition of the Nugent concern is stated to have been prompted

by the need for additional capacity to take care of an increasing number of new customers and to bring about manufacturing economies by allocating certain specialized products to the Milwaukee plant and concentrating on others at Chicago. The two companies have served such industries as those manufacturing refinery and oil well equipment, construction and road-building machinery; the automotive, tractor and industrial car manufacturers; producers of mining machinery, engines, pumps, printing machinery and many other lines.

C. R. Messinger, formerly president, becomes chairman of the board, while Lamar Perego, formerly vice-president, secretary and general manager, becomes president and general manager.

Output of Steel Castings Down in January

WASHINGTON, Feb. 18.—Computed bookings for commercial steel castings in January totaled 97,228 tons, compared with 94,653 tons in December, according to reports received by the Department of Commerce. January orders were made up of 39,281 tons of railroad specialties and 57,947 tons of miscellaneous castings.

Production in January was 102,133 tons, the lowest since February, 1929, with a total of 97,568 tons. The output last December was 106,927 tons. Production in January consisted of 41,465 tons of railroad specialties and 60,668 tons of miscellaneous castings.

Malleable Castings Output at Low Level

WASHINGTON, Feb. 18.—Orders for malleable castings in January reported to the Department of Commerce, totaled 43,180 tons. When estimated on the total capacity, the figure would be approximately 56,000 tons. The reported bookings in January were the lowest since November of last year, when they were 40,316 tons, while in December they were 44,589 tons.

Production in January, based on the reports received, was 44,080 tons, the lowest since August, 1924. Production in December was 48,202 tons. Shipments reported in January were 44,218 tons, the lowest since September, 1924, with a total of 44,055 tons. Shipments in December were 50,013 tons.

The Globe Steel Tubes Co., Milwaukee, will hereafter handle the sale of high chrome and chrome nickel tubes, in the Eastern district of the United States, through its own Eastern sales office, instead of through agencies. R. R. Lally, manager of sales, who is in charge of this office, 110 East Forty-second Street in New York, will have direct supervision of stainless tubing sales.

Railroad Equipment

Louisville & Nashville Orders 1800 Cars

ORDERS for freight cars in the week totaled 2471, including 1800 for the Louisville & Nashville and 500 for the Canadian Pacific. The remainder was in small lots for various roads. New inquiries appeared for 330. The Union Pacific is inquiring for 25 locomotives. Details of the week's business follow:

Louisville & Nashville has ordered 500 gondola cars, 300 hopper cars and 250 flat cars from the Pressed Steel Car Co., 500 box cars from the Mount Vernon Car Mfg. Co. and 250 gondola cars from the Pullman Car & Mfg. Corporation. This road is inquiring for 23 items of passenger equipment as follows: 10 baggage cars, 4 passenger-baggage, 4 coach-smoking cars, 2 baggage-mail and 3 dining cars.

Central Railroad of New Jersey is inquiring for 25 passenger cars.

Pere Marquette has ordered 25 caboose cars from Magor Car Corporation.

Missouri Pacific has ordered 20 drovers' caboose cars from St. Louis Car Co. Chicago, Rock Island & Pacific will build 50 caboose cars in its own shops. It has awarded 10 passenger coaches and 4 parlor cars to Pullman Car & Mfg. Corporation.

Northern Pacific is inquiring for 2 locomotives of the 2-10-0 type.

Youngstown Sheet & Tube Co. is inquiring for 80 gondola car bodies.

Inland Lime & Stone Co. is in the market for 25 or 30 gondola cars.

General Chemical Co. has ordered 15 tank cars from American Car & Foundry Co.

Rock Island Refining Co. is inquiring for 200 tank cars.

Calumet & Hecla Consolidated Copper Co. has ordered four 20-yd. air dump cars from Koppel Industrial Car & Equipment Co.

Wagner Quarries Co. has ordered two air dump cars from Koppel Industrial Car & Equipment Co.

Anglo-Chilean Consolidated Nitrate Corporation has ordered 20 box cars from Magor Car Corporation.

International Railways of Central America have ordered 35 steel-frame stock cars from Gregg Co.

Reading Co. is inquiring for electrical equipment for 61 passenger motor cars, seven passenger and baggage motor cars and two passenger, baggage and mail motor cars.

Canadian Pacific has ordered 250 refrigerator cars, 10 baggage cars, 13 first-class car underframes, eight dining and seven smoking car underframes from National Steel Car Corporation; 250 75-ton coal cars, 50 sleeping and three mail cars, five compartment and two sleeping car underframes from Canadian Car & Foundry Co.

Union Pacific will buy 25 three-cylinder 4-12-2 type locomotives.

Missouri-Kansas-Texas is in the market for 100 70-ton general service gondola cars.

Harbison-Walker Refractories Co., Pittsburgh, in the year ended Dec. 31, 1929, had net income after all charges of \$5,256,413. After dividends on common and preferred stock, \$1,893,463 was added to surplus, increasing it to \$8,992,502.

Pacific Coast

Demand for Steel Is Well Maintained, Though Volume of Pending Business Is Not Large

SAN FRANCISCO, Feb. 15 (by Air Mail).—Interest this week was centered in the sixth annual conference of the Iron, Steel and Allied Industries of California, held at Del Monte, Feb. 13 to 15. The attendance was unusually large, and a greater number of Eastern mill representatives were present this year.

Demand for steel is well maintained, although few large tonnages have been placed. The warehouse situation in the San Francisco district has been unsettled during the past week or two, some low prices having been in evidence.

Pig Iron.—Little of importance occurred in the market for foundry pig iron this week, both sales and inquiries having been confined to small lots.

Prices per gross ton at San Francisco:

*Utah basic	\$25.00 to \$26.00
*Utah fdy., sil. 2.75 to 3.25	25.00 to 26.00
**Indian fdy., sil. 2.75 to 3.25	25.00 to 26.00

*Delivered San Francisco.

**Duty paid, f.o.b. cars San Francisco.

Bars.—The Pacific Coast Steel Corporation took 1005 tons for the Kings County Hospital, Seattle. Pending business is not large. Bids will be opened Feb. 27 on 123 tons for a bridge over the Klamath River, near Keno, Ore. Merchant bar steel moves in small lots only. Prices on this class of material remain unchanged at 2.35c., base, c.i.f. coast ports.

Plates.—Some improvement in demand for plates is noted. The Western Pipe & Steel Co. took 350 tons for underground tanks for the Shell Oil Co., San Francisco, and the Standard Oil Co., San Francisco, placed 400 tons with an unnamed Eastern mill. This

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and struc. shapes.....	3.30c.
Soft steel bars.....	3.30c.
Small angles, $\frac{1}{4}$ -in. and over.....	3.15c.
Small angles, under $\frac{1}{4}$ -in.....	3.55c.
Small channels and tees, $\frac{3}{4}$ -in. to 2 $\frac{1}{2}$ -in.....	3.75c.
Spring steel, $\frac{1}{4}$ -in. and thicker.....	5.00c.
Black sheets (No. 24).....	4.90c.
Blue ann'd sheets (No. 10).....	3.90c.
Galv. sheets (No. 24).....	5.30c.
Struc. rivets, $\frac{1}{2}$ -in. and larger.....	5.65c.
Com. wire nails, base per keg.....	\$3.40
Cement c't'd nails, 100 lb. keg.....	3.40

company is also in the market for 640 tons. Prices are not firm at 2.25c., c.i.f.

Shapes.—Activity in the structural market is not pronounced. Few projects are up for figures. The California Steel Co. took 250 tons for a garage in Honolulu, and the Honolulu Iron Works booked 265 tons for three buildings for Libby, McNeil & Libby in the Hawaiian Islands. The Western Iron Works secured 100 tons for a paint factory in San Francisco. Plain material is firm at 2.35c., c.i.f. Bids will be opened Feb. 25 on 1400 tons for a hospital at the Presidio, San Francisco.

Cast Iron Pipe.—Bids will be opened Feb. 18 on 205 tons of 4 and 6-in. Class B pipe for Compton, Cal. Tacoma, Wash., has opened bids on 123 tons of 4 to 8-in. Bids will be opened Feb. 18 for 206 tons of 10 and 16-in. Class B pipe for Alhambra, Cal., and on Feb. 20 for 1545 tons of 6 to 30-in. Classes B, C and 250 pipe for Glendale, Cal. Aberdeen, Wash., will open bids Feb. 19 on 263 tons of 2 to 12-in. Class B pipe. Tempe, Ariz., will open bids Feb. 20 on 108 tons of 2 to 6-in. Class 150 pipe.

ers are light, though pending business is seasonally favorable. The Tennessee company is operating all eight open-hearths at Fairfield and eight of nine at Ensley, an increase of one at each place. The Gulf States Steel Co. continues to work four of six at Alabama City while the new blooming mill is being installed.

Cast Iron Pipe.—A project at Kansas City, Mo., requiring approximately 8000 tons, on which bids are to be opened Feb. 26, is the only outstanding project being figured by district plants. Numerous small to fair-sized projects, either up for bids or in prospect, give the market a favorable tone. Utilities, which have done most of the contract buying this year so far, are still placing occasional tonnages. The United States Pipe & Foundry Co. has received contracts for about 450 tons for St. Martinville, La., and 300 tons for Savannah, Ga. Pressure pipe makers continue to ship about what they are making. Prices are firm and unchanged at \$37 to \$38 a ton, Birmingham, for 6-in. and larger diameters.

Coke.—Active by-product ovens have been reduced from 1382 to 1201. Stocks of commercial producers are reported higher than one year ago. Prices are without change at \$5 a net ton, Birmingham.

Old Material.—Steel scrap consumers have been holding up shipments this month in order to cut down their surplus stocks. Only one large user of steel scrap is actively engaging in the market. There is no market for iron scrap. Quotations are unchanged, though prices are uncertain in the absence of trading.

Prices per gross ton, deliv'd Birmingham dist. consumers' yards:

Heavy melting steel.....	\$13.00 to \$13.50
Scrap steel rails.....	14.00
Short shoveling turnings.....	9.00
Cast iron borings.....	9.00
Stove plate	11.50 to 12.00
Steel axles	22.00
Iron axles	23.00
No. 1 railroad wrought.....	10.00 to 10.50
Rails for rolling.....	15.50
No. 1 cast.....	12.00
Tramcar wheels.....	12.50
Cast iron carwheels.....	13.00 to 13.50
Cast iron borings, chem.....	13.50 to 14.00

Birmingham

Ingot Output at Close to Capacity and Steel Backlogs Are Maintained—Pig Iron Dull

BIRMINGHAM, Feb. 18.—Pig iron buying is in small lots. Shipments are at a fairly steady rate and approximate current production. A few small inquiries have been received for second quarter, but the trade in general has shown no interest beyond this quarter. The Woodward Iron Co. has changed its Woodward No. 2 furnace from basic to foundry iron. All other furnaces are without change. Of the 17 active furnaces, 11 are on foundry iron, five on basic and one on recarburizing iron.

Prices per gross ton, f.o.b. Birmingham dist. furnaces:

No. 2 fdy., 1.75 to 2.25 sil..	\$14.50 to \$15.00
No. 1 fdy., 2.25 to 2.75 sil..	15.00 to 15.50
Basic	14.50 to 15.00

Finished Steel.—With ingot production close to capacity, mill interests are pleased to find that backlogs are being maintained. A decline in sheet buying is offset by better bookings of railroad accessories, structural shapes and bars. Large fabricating shops are operating on full schedules and have fair backlogs, while small shops are in need of tonnages. Plants in the district are bidding on 1650 tons for the new sheet mill of the Gulf States Steel Co. and 650 tons for four new buildings at Auburn, Ala. The Nashville Bridge Co. has booked 350 tons additional for the Southern Phosphate Co. plant at Bartow, Fla., and 300 tons for the Phoenix Utility Co. Actual orders of reinforcing bar manufactur-

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.365c.
Structural shapes—	
Angles and beams.....	3.265c.
Tees	3.365c.
Zees	3.465c.
Soft steel bars, small shapes.....	3.265c.
Flats, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway rounds	6.60c.
Norway squares and flats.....	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tie steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold-rolled steel—	
Rounds and hex.....	*3.55c. to 5.55c.
Squares and flats.....	*4.05c. to 7.05c.
Toe calk steel.....	6.00c.
Rivets, structural or boiler.....	4.50c.

Per Cent Off List

Machine bolts .....	.50 and 5
Carriage bolts .....	.50 and 5
Lag screws .....	.50 and 5
Hot-pressed nuts .....	.50 and 5
Cold-punched nuts .....	.50 and 5
Stove bolts .....	.70 and 10

*Including quantity differentials.

Boston

Pig Iron Sold for Deliveries Extending into Second Quarter —Scrap Trade More Active

BOSTON, Feb. 18.—Pig iron sales the past week approximated 6000 tons, of which about half was taken by the General Fire Extinguisher Co., Providence, R. I. That company bought 1500 tons of Buffalo iron, 800 tons of Mystic, 700 tons of Alabama and 200 tons of Buffalo malleable for first and second quarter delivery. The Buffalo iron was sold on a rail and water rate. The Alabama iron brought \$13 a ton, base furnace. The average delivered cost of the 3000 tons is understood to have been close to \$19.40 a ton. Other sales were in small tonnages at prices equivalent to \$16.50 a ton, base Buffalo. A small tonnage of Indian iron was sold at \$21.50 a ton, duty paid, on dock here, for No. 2X. Two Massachusetts melters are in the market for iron, one for 2000 tons and the other for 600 to 1000 tons.

Foundry iron prices per gross ton deliv'd to most New England points:

*Buffalo, sil. 1.75 to 2.25..	\$21.41 to \$21.91
*Buffalo, sil. 2.25 to 2.75..	21.41 to 21.91
East. Penn., sil. 1.75 to 2.25	22.65 to 23.15
East. Penn., sil. 2.25 to 2.75	23.15 to 23.65
Va., sil. 1.75 to 2.25.....	25.21
Va., sil. 2.25 to 2.75.....	25.71
*Ala., sil. 1.75 to 2.25.....	24.11
*Ala., sil. 2.25 to 2.75.....	24.61
†Ala., sil. 1.75 to 2.25.....	20.25
†Ala., sil. 2.25 to 2.75.....	20.75

Freight rates: \$4.91 all rail from Buffalo; \$3.65 all rail from eastern Pennsylvania; \$5.21 all rail from Virginia; \$9.61 all rail from Alabama and \$5.75 rail and water from Alabama to New England seaboard.

*All rail rate.
†Rail and water rate.

Cast Iron Pipe.—Boston has awarded 50 tons of 4-in. pipe in 6-ft. lengths, 100 tons of 6-in., 500 tons of 8-in., 1400 tons of 12-in. and 50 tons of 24-in. pipe to the Warren Foundry & Pipe Co., a total of 2100 tons; also 10 tons of 24 to 48-in. special castings. The Warren Foundry & Pipe Co. was the third lowest bidder on this business. The Herbert Kennedy Co., representing the French interest, bid \$2.05 a ton less than Warren, but specifications were not in accordance with the city's requirements. Woburn, Mass., will spend \$10,000 on water mains; Saugus, Mass., \$13,000; Blandford, Mass., \$25,000; and Holyoke, Mass., \$150,000. Prices on domestic water pipe are steady and unchanged.

Warehouse Business.—Wire nails have again been cut 10c. a keg to \$3.05, base, from stock. Both fence and poultry netting staples and barbed wire also have been reduced 10c. per 100 lb.

Reinforcing Steel.—The Republic Fireproofing Co., New York, has been awarded 175 tons of reinforcing material for the Atlantic National Bank, Boston. Material for foundations will be let this week. Bids close Feb. 21 on 600 tons of billet reinforcing steel bars wanted for a Sears, Roebuck & Co. store addition. Prices quoted openly for such bars are: From stock, 1 to

5 tons, 3.16½c. to 3.26½c. a lb., f.o.b. metropolitan Boston; 5 to 99 ton lots, 2.86½c.; 100 ton and larger lots, 2.76½c. Owing to keen competition for business, prices are more or less elastic, however. Rail steel bars are 2.26½c. a lb., base, delivered Boston freight rate points.

Old Material.—The movement of old material out of New England to the Pittsburgh district is gathering momentum, but that to eastern Pennsylvania continues limited owing to the low prices offered there. Most of the No. 1 heavy melting steel sold the past week was at \$10.75 to \$10.80, on cars shipping point, or \$16.50, delivered Pittsburgh territory, but some business was transacted at \$11, shipping point. Worcester, Mass., and Weirton, W. Va., consumers are taking fair tonnages of long bundled skeleton, and a New England consumer is buy-

ing shafting. Current sales of steel turnings are mostly at \$6.50 to \$6.60 a ton, on cars shipping point, and steel mill borings are at or close to \$6.35. Stove plate for eastern Pennsylvania consumption is moving at \$7.60 a ton, shipping point. Shipments of chemical borings to New Jersey are again held up. Textile machinery cast is being pressed for sale, consequently prices are easier.

Buying prices per gross ton, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel..	\$10.50 to \$11.00
Scrap T rails.....	10.25 to 10.50
Scrap girder rails.....	9.25 to 9.50
No. 1 railroad wrought....	10.50 to 11.00
No. 1 yard wrought.....	9.50 to 10.00
Machine shop turnings....	6.50 to 7.00
Cast iron borings (steel works and rolling mill)	6.00 to 6.50
Bundled skeleton, long....	8.50 to 9.00
Forge flashings.....	9.00 to 9.25
Blast furnace borings and turnings.....	5.75 to 6.00
Forge scrap.....	8.50 to 9.00
Shafting.....	14.50 to 15.00
Steel car axles.....	16.00 to 17.00
Wrought pipe 1 in. in diameter (over 2 ft. long)	9.00 to 9.50
Rails for rolling.....	10.50 to 10.75
Cast iron borings, chemical	8.50 to 9.00

Prices per gross ton deliv'd consumers' yards:

Textile cast.....	\$13.00 to \$14.00
No. 1 machinery cast.....	15.00 to 15.25
No. 2 machinery cast.....	14.00 to 14.50
Stove plate.....	10.50 to 11.00
Railroad malleable.....	17.00 to 17.50

St. Louis

Pig Iron Sales Fairly Large—Implement, Stove and Auto Parts Makers Busier

ST. LOUIS, Feb. 18.—Sales of pig iron in this district continue on a fairly large scale. The St. Louis Gas & Coke Corporation is said to have sold approximately 15,000 tons during the first two weeks of February, while Southern makers continue their aggressive selling campaign among Northern melters at from \$13 to \$13.50 a ton, Birmingham. It is believed now that most melters in the district have covered their first quarter requirements and that in some cases shipments will run into second quarter. The melt is increasing. Implement, stove and automobile parts makers report improved business.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City, Ill...	\$19.50 to \$20.00
Malleable, f.o.b. Granite City.....	20.00
N'th'n No. 2 fdy., deliv'd St. Louis.....	22.16
Southern No. 2 fdy., deliv'd	17.42 to 18.42
Northern malleable, deliv'd	22.16
Northern basic, deliv'd....	22.16

Freight rates: 75c. (average) Granite City to St. Louis; \$2.16 from Chicago; \$4.42 from Birmingham.

Finished Steel.—Word has been received here that the Sheffield Steel Corporation will roll the 4500 tons of reinforcing bars required for paving work in Oklahoma during 1930. Business is quiet in reinforcing bars and structural steel. The Chicago & Illinois Midland, which has covered on its requirements of tie plates for the year, has asked for prices on spikes and bolts. Specifications against contracts and new business in plates, shapes and bars are in fair volume.

Old Material.—A fairly large tonnage of heavy melting steel was placed with several dealers by a leading East Side consumer, and there also was some buying of rolling mill and malleable grades. Consumers are willing to buy at present prices, but dealers are taking only such business as they must take. Outside of shipments by railroads, very little material is coming to this market, country dealers complaining of the low prices prevailing here. Railroad springs and railroad malleable are up 50c. a ton, while rails for rolling are 50c. a ton lower. Railroad lists: Chesapeake & Ohio, 8357 tons; Louisville & Nashville, 8000 tons; Chicago, Burlington & Quincy, 4575 tons; Chicago & Alton, 1340 tons; Missouri-Kansas-Texas, 1245 tons; In-

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and struc. shapes.....	3.25c.
Bars, soft steel or iron.....	3.15c.
Cold-fin. rounds, shafting, screw stock.....	3.75c.
Black sheets (No. 24).....	4.25c.
Galv. sheets (No. 24).....	4.85c.
Blue ann'd sheets (No. 10).....	3.45c.
Black corrug. sheets (No. 24).....	4.30c.
Galv. corrug. sheets.....	4.90c.
Structural rivets.....	4.15c.
Boiler rivets.....	4.15c.
Per Cent Off List	
Tank rivets, ¼-in. and smaller, 100 lb. or more.....	65
Less than 100 lb.....	60
Machine bolts.....	60
Carriage bolts.....	60
Lag screws.....	60
Hot-pressed nuts, sq., blank or tapped, 200 lb. or more.....	60
Less than 200 lb.....	50
Hot-pressed nuts, hex., blank or tapped, 200 lb. or more.....	60
Less than 200 lb.....	50

ternational Great Northern, 1130 tons; Chicago, Rock Island & Pacific, 130 carloads; Pullman Co., St. Louis, six carloads.

Dealers' buying prices per gross ton, f.o.b. St. Louis district:

No. 1 heavy melting or shoveling steel.....	\$12.50 to \$13.00
No. 2 heavy melting or shoveling steel.....	11.75 to 12.25
No. 1 locomotive tires....	14.50 to 15.00
Misc. stand.-sec. rails including frogs, switches and guards, cut apart....	13.50 to 14.00
Railroad springs	16.00 to 16.50
Bundled sheets	9.50 to 10.00
No. 2 railroad wrought....	12.50 to 13.00
No. 1 busheling.....	9.75 to 10.25
Cast iron borings and shoveling turnings	9.25 to 9.75
Iron rails	13.00 to 13.50
Rails for rolling.....	14.00 to 14.50
Machine shop turnings....	6.75 to 7.25
Heavy turnings	9.00 to 9.50
Steel car axles.....	19.50 to 20.00
Iron car axles.....	26.00 to 26.50
Wrot. iron bars and trans.	21.50 to 22.00
No. 1 railroad wrought....	13.00 to 13.50
Steel rails, less than 3 ft.	17.00 to 17.50
Steel angle bars.....	14.00 to 14.50
Cast iron carwheels.....	14.00 to 14.50
No. 1 machinery cast.....	15.25 to 15.75
Railroad malleable	14.50 to 15.00
No. 1 railroad cast.....	14.00 to 14.50
Stove plate	11.75 to 12.25
Relay, rails 60 lb. and under	20.50 to 23.50
Relay, rails 70 lb. and over	26.50 to 29.00
Agricult. malleable.....	13.00 to 13.50

down \$1 a ton at both Toronto and Montreal. No. 1 foundry iron is now \$22.60 at Toronto, a price, which, it is believed, will tend to shut out United States competition, which has been keener since the Buffalo furnaces reduced their prices \$1 several weeks ago. Allowing for duty, freight and exchange, No. 1 iron would have to be sold at \$16.50, Buffalo, to be a competitive factor in the local market. Whether the Buffalo interests will go that low remains to be seen. Melters who had been withholding contracts in the expectation that prices might be reduced are placing orders with more confidence.

Prices per gross ton:

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75.....	\$22.60
No. 2 fdy., sil. 1.75 to 2.25.....	22.10
Malleable	22.60
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75.....	\$24.00
No. 2 fdy., sil. 1.75 to 2.25.....	23.50
Malleable	24.00
Basic	22.50

Imported Iron, Montreal Warehouse
Summerlee

Old Material.—The demand for iron and steel scrap shows more life in the

Toronto and Montreal districts. Mills are coming into the market for small lots for immediate delivery, with the result that sales of heavy melting steel and turnings have increased. Much of the improvement, however, centers in iron scrap, with steady buying reported by foundry and other consumers of machinery cast, stove plate and malleable scrap. Prices are unchanged.

Dealers' buying prices:

Per Gross Ton		Toronto	Montreal
Heavy melting steel.....	\$9.00		\$8.00
Rails, scrap.....	11.00		9.00
No. 1 wrought.....	9.00		11.00
Machine shop turnings	7.00		6.00
Boiler plate.....	7.00		6.50
Heavy axle turnings	7.50		6.50
Cast borings	6.50		5.00
Steel borings	6.50		6.00
Wrought pipe	6.00		6.00
Steel axles	14.00		17.00
Axles, wrought iron.....	16.00		19.00
No. 1 machinery cast			16.00
Stove plate			12.00
Standard carwheels.....			14.50
Malleable			13.00
Per Net Ton			
No. 1 mach'y cast.....	\$15.00		....
Stove plate	11.00		....
Standard carwheels.....	14.00		....
Malleable scrap.....	11.00		....

Canada

Railroad Equipment Orders Help Business Situation

TORONTO, ONT., Feb. 18.—While business in steel and allied products is coming from widely scattered sources, the expenditures of the railroads are having an important effect in bringing to the Canadian steel industry a considerable volume of orders. More than \$50,000,000 will be expended on new equipment and other betterments by the Canadian Pacific Railway during 1930, it is announced by E. W. Beatty, chairman and president. Orders have been placed for new equipment and for rebuilding old equipment at a cost of \$14,442,750. All of the new units are to be built in Canadian shops, and Canadian material will be used so far as possible.

Structural steel demands are increasing. It is estimated that about 50,000 tons is pending for early closing. Plans for other buildings are being prepared.

Pig Iron.—Prices have been marked

Warehouse Prices, f.o.b. Cincinnati

Base per Lb.	
Plates and struc. shapes.....	3.40c.
Bars, soft steel or iron.....	3.30c.
New billet reinforce. bars.....	3.15c.
Rail steel reinforce. bars.....	3.00c.
Hoops	4.05c.
Bands	3.50c.
Cold-fin. rounds and hex.....	3.85c.
Squares	4.35c.
Black sheets (No. 24).....	4.05c.
Galvanized sheets (No. 24).....	4.90c.
Blue ann'd sheets (No. 10).....	3.45c.
Structural rivets	4.20c.
Small rivets	60 per cent off list
No. 9 ann'd wire, per 100 lb.....	\$3.00
Com. wire nails, base per keg.....	2.85
Cement c'd nails, base 100 lb. keg	2.85
Chain, per 100 lb.....	10.25
Net per 100 Ft.	
Lap-welded steel boiler tubes, 2-in.....	\$16.50
4-in.....	34.50
Seamless steel boiler tubes, 2-in.....	17.50
4-in.....	36.00

Cincinnati

Pig Iron Demand Increases—Scrap Market Turns Stronger—Sheet Specifications Decline Sharply

CINCINNATI, Feb. 18.—While district consumers of pig iron are buying cautiously, the demand is sustained at a high level for the middle of the quarter. In fact, last week was the best this year, eclipsing the preceding week by several hundred tons. Total sales were approximately 8325 tons, of which about 2225 tons was Southern iron. The market is featured by the contrast between the weakness of Southern pig iron prices and the firmness of Northern quotations, which, while meeting some resistance from consumers, have been held except for occasional slight concessions on silicon differentials. Northern iron was sold last week at about \$18.50 base Lake furnace. Southern iron, however, is being openly sold at \$13.50, base Birmingham, and, when some furnaces attempted to obtain \$14, the business went elsewhere. A central Indiana buyer took 1000 tons of Southern foundry iron and three other consumers in the same area bought 800 tons, 500 tons and 400 tons of Northern foundry iron. A Springfield, Ohio, melter bought 200 tons.

Prices per gross ton, deliv'd Cincinnati:

So. Ohio fdy., sil. 1.75 to 2.25.....	\$19.89 to \$20.39
Ala. fdy., sil. 1.75 to 2.25.....	17.19 to 18.19
Ala. fdy., sil. 2.25 to 2.75.....	17.69 to 18.69
Tenn. fdy., sil. 1.75 to 2.25.....	17.69 to 18.19
S'th'n Ohio silvery, 8 per cent	26.89

Freight rates, \$1.89 from Ironton and Jackson, Ohio; \$3.69 from Birmingham.

Finished Steel.—Orders for sheets dropped below production last week. The leading interest in this district

reports that fresh bookings were approximately 60 per cent of normal capacity and that a reduction of production schedules will be necessary next week. The chief factor in the decline has been a curtailment of specifications from the automotive field. However, a slight increase has been noted in business from manufacturers of electrical devices, but this has not been sufficient to offset the decline in the automotive field. Sheet stocks of district mills have been replenished and quick delivery on any stock grade can be made.

Old Material.—The scrap market has acquired a stronger tone. Dealers are bidding 25c. higher on heavy melting steel, No. 2 wrought, short rails and scrap rails and 50c. more on cast iron borings. Railroad lists which closed last week brought much higher prices than dealers have been paying for the last 30 days.

Dealers' buying prices per gross ton, f.o.b. cars, Cincinnati:

Heavy melting steel.....	\$12.75 to \$13.25
Scrap rails for melting.....	13.25 to 13.75
Loose sheet clippings.....	8.00 to 8.50
Bundled sheets	10.75 to 11.25
Cast iron borings.....	9.00 to 9.50
Machine shop turnings.....	8.25 to 8.75
No. 1 busheling.....	10.00 to 10.50
No. 2 busheling.....	6.50 to 7.00
Rails for rolling.....	13.50 to 14.00
No. 1 locomotive tires.....	14.25 to 14.75
No. 2 railroad wrought....	13.00 to 13.50
Short rails	17.75 to 18.25
Cast iron carwheels.....	12.00 to 12.50
No. 1 machinery cast.....	18.50 to 19.00
No. 1 railroad cast.....	15.00 to 15.50
Burnt cast	10.00 to 10.50
Stove plate	10.00 to 10.50
Brake shoes	10.00 to 10.50
Agricultural malleable	14.00 to 14.50
Railroad malleable	15.00 to 15.50

Buffalo

Steel Mill Operations Show Slight Increase—Pig Iron Dull, But Shipments Go Forward Steadily

BUFFALO, Feb. 18.—The situation in pig iron is about as quiet as it has been in months. There apparently is no sizable inquiry out nor any great aggregate of small inquiries. No large orders are noted. Buffalo furnaces have sold probably 5000 tons during the past week, all in small lots. Shipments on old orders are moving out promptly and producers report considerable improvement in February over January. The price of \$18.50 is being firmly held in the district. Another stack was blown in by the Hanna Furnace Co., making 11 in blast in the district.

Prices per gross ton f.o.b. furnace:

No. 2 fdy., sil. 1.75 to 2.25.....	\$18.50
No. 2X fdy., sil. 2.25 to 2.75.....	19.00
No. 1 fdy., sil. 2.75 to 3.25.....	20.00
Malleable, sil. up to 2.25.....	19.00
Basic.....	17.00
Lake Superior charcoal.....	27.28

Finished Steel.—Operations of Buffalo mills show a slight increase over last week, with the Lackawanna plant of the Bethlehem Steel Co. now operating 21 of its 24 open-hearths, about half of its mills on single turn and about half on double turn. The Donner Steel Co. is operating three 100-ton furnaces and one 200-ton furnace. The Seneca Iron & Steel Co. is at about 70 per cent, and Wickwire-Spencer, 50 per cent. Structural fabricators report a considerable volume of small business but nothing of size. Reinforcing bar makers are interested in an inquiry from Erie, Pa., for 400 to 500 tons for a city filtration plant. About 300 tons of galvanized pipe for the new city hall in Buffalo was awarded to the Bethlehem Steel Co.

Old Material.—The principal item of importance in this market was the sale of 5000 tons of No. 1 steel and No. 2 steel at \$14 for the No. 1 and \$12.50 for the No. 2. Information has just been developed that another consumer bought 4000 tons of No. 1 heavy melting steel at \$15.50 about two weeks ago. The market for most

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and struc. shapes.....	3.40c.
Soft steel bars.....	3.30c.
Reinforcing bars.....	2.95c.
Cold-fin. flats, sq. and hex.....	4.45c.
Round.....	3.95c.
Cold-rolled strip steel.....	5.85c.
Black sheets (No. 24).....	4.20c.
Galv. sheets (No. 24).....	4.85c.
Blue ann'd sheets (No. 10).....	3.50c.
Com. wire nails, base per keg.....	\$3.35
Black wire, base per 100 lb.....	3.45

buyers of selected No. 1 heavy melting is undoubtedly \$15.50, as there usually is a considerable spread between the prices paid by these two interests owing to a difference in the specifications.

Prices per gross ton f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades:		
No. 1 heavy melting steel.....	\$14.50 to	\$15.50
No. 2 heavy melting scrap.....	12.50	
Scrap rails.....	14.75 to	15.25
Hydraul. comp. sheets.....	12.50	
Hand bundled sheets.....	10.50 to	11.00
Drop forge flashings.....	12.50	
No. 1 busheling.....	13.00 to	13.75
Hvy. steel axle turnings.....	13.50 to	14.00
Machine shop turnings.....	9.50 to	10.00
No. 1 railroad wrought.....	11.00 to	11.50
Acid Open-Hearth Grades:		
Knuckles and couplers.....	18.00 to	19.00
Coil and leaf springs.....	18.00 to	19.00
Rolled steel wheels.....	18.00 to	18.50
Low phos. billet and bloom ends.....	18.00 to	19.00
Electric Furnace Grades:		
Short shov. steel turnings.....	12.50 to	13.00
Blast Furnace Grades:		
Short mixed borings and turnings.....	10.75 to	11.25
Cast iron borings.....	11.00 to	11.50
No. 2 busheling.....	8.00	
Rolling Mill Grades:		
Steel car axles.....	17.00 to	17.50
Iron axles.....	20.00 to	21.00
Cupola Grades:		
No. 1 machinery cast.....	14.50 to	15.00
Stove plate.....	12.75	
Locomotive grate bars.....	10.50 to	11.00
Steel rails, 3 ft. and under.....	17.50 to	18.00
Cast iron carwheels.....	12.00 to	12.50
Malleable Grades:		
Industrial.....	16.50 to	17.00
Railroad.....	16.50 to	17.00
Agricultural.....	16.50 to	17.00
Special Grades:		
Chemical borings.....	12.00 to	12.50

It is estimated that there are at least 10,000,000 tons of recoverable manganese ore from mines which are located about 4 miles from the sea coast. The ore is said to run about 45 per cent manganese and can be mined in large pieces, easily handled. The corporation formed by the German syndicate is named Sudanatolische Bergbau Aktiengesellschaft.

The Industrial Clearing Corporation, 120 Broadway, New York, became interested in this German company and formed the International Manganese Corporation, which purchased the shares allotted to the American group. Additional shares of the parent company were sold to French and Swiss groups, the purpose being to have local groups there to care for the

sales of such manganese in those countries as it might be possible to arrange.

The statement is made that the mine is in operation and that the entire output for the first half of this year has been sold to French companies and that shipments to America will not begin until the latter half of 1930.

Hocking Valley Builds New Ore and Coal Docks

New ore and coal docks have been erected by the Hocking Valley Railroad at Presque Isle, on Maumee Bay, at the mouth of the Maumee River, Toledo, Ohio. The site is about 3 miles nearer Lake Erie than the present docks of the railroad.

The plant will consist of two slips, with a depth of 23 ft., and each slip will hold 10 of the largest vessels now afloat on the Great Lakes. The ore handling facilities will consist of three stiff-legged all-electric Wellman-Seaver-Morgan machines, with a capacity for unloading from vessel to cars of 10,000 tons in 4 hours. The coal docks will be equipped with two Brown Hoist electric car dumpers, each having a capacity for dumping 50 cars an hour.

The ore handling facilities will be ready for the opening of navigation, and the coal docks will be placed in operation by June 1.

Hanna Furnace Co. to Move to Detroit

The Hanna Furnace Co., Cleveland, which is now designated as the merchant pig iron division of the National Steel Corporation, will move its offices to Detroit, April 1. Members of the organization who will be transferred to Detroit include C. A. Collins, president; R. E. McMahon, vice-president in charge of sales; W. G. Sharp, vice-president, and W. E. Arden, secretary-treasurer. The name of the company will be changed to the Hanna Furnace Corporation. The iron ore, vessel and other departments of the M. A. Hanna Co. will remain in Cleveland. The Hanna Furnace Co., which became a unit of the National Steel Corporation, through the recent merger of various Hanna subsidiaries with the Weirton Steel Co. and the Great Lakes Steel Corporation, has two merchant blast furnaces in Detroit and seven in Buffalo.

Worth Steel Co. to Make Blue Annealed Sheets

The Worth Steel Co., Claymont, Del., is taking bids on sheet mill equipment to be installed in the building which houses its plate mills. It is probable that an 84-in., two-high mill will be bought, together with annealing furnaces and other necessary equipment.

New Corporation to Handle Turkish Manganese

The International Manganese Corporation has been incorporated in the United States as a holding company to own a percentage of the shares of a German corporation which is exploiting manganese concessions in South Anatolia, Turkey in Asia. These concessions are located near Goedjek, on the Mediterranean Coast, about 100 miles east of the Island of Rhodes. These concessions, which are being opened up by German corporations in which the International Manganese Corporation owns a substantial interest, are regarded as in a favorable location from the standpoint of low costs.

Fabricated Structural Steel

New Projects Total 52,000 Tons, Largest of Year—Awards of 32,000 Tons Below Those of Previous Weeks

ALTHOUGH awards of structural steel in the past week totaled only 32,000 tons, as compared with totals of more than 50,000 tons in each of the three previous weeks, the volume of new projects which came into the market, at 52,000 tons, was the largest for any week of the year. The next highest figure was 44,000 tons in the last week of January.

The projected work is well distributed over the country and includes some sizable jobs. Grade separation work for the Union Station, Chicago, calls for 6800 tons; a pier shed for the Munson Line in New York, 5000 tons, and a bank building in St. Paul, Minn., 6000 tons. The week's awards include 5000 tons for a warehouse in New York, 2000 tons for an addition to the New York Curb Exchange Building and 3200 tons in transmission towers for the Northern Indiana Public Service Corporation. Awards follow:

BOSTON, 1900 tons, Atlantic National Bank addition, to Palmer Steel Co.
 EVERETT, MASS., 120 tons, buildings for Warren Foundry & Pipe Co., to McClintic-Marshall Co.
 BINGHAM, ME., 230 tons, power house roof, to Lyons Iron Works.
 BOSTON & MAINE RAILROAD, 500 tons, railroad bridge at West Claremont, N. H., to American Bridge Co.
 NEW YORK, 11,000 tons, office building, Broadway at Thirty-eighth Street, to Harris Structural Steel Co.
 NEW YORK, 2000 tons, addition to New York Curb Exchange, to Shoemaker Bridge Co.
 NEW YORK, 300 tons, garage at 312 East Ninety-fourth Street, to Kues Brothers, New York.
 NEW YORK, 5000 tons, warehouse at 529 West Twentieth Street for Baker & Williams, to Levering & Garrigues Co.
 NEW YORK, 200 tons, junior beams, Park Avenue apartment building, to Jones & Laughlin Steel Corporation.
 STATE OF NEW YORK, 150 tons, highway bridge, to American Bridge Co.
 NEW YORK CENTRAL RAILROAD, 800 tons, bridge at New Hamburg, N. Y., to Phoenix Bridge Co.
 KEARNY, N. J., 1800 tons, Western Electric Co. building, to McClintic-Marshall Co.
 STATE OF NEW JERSEY, 1600 tons, highway bridge over Hackensack River near Secaucus, to Bethlehem Steel Co.
 IRVINGTON, N. J., 160 tons, junior beams, East Orange apartment building, to Jones & Laughlin Steel Corporation.
 LEWISTOWN, PA., 350 tons, building for Viscose Co., to Belmont Iron Works.
 PHILADELPHIA, 300 tons, junior beams, section two of Strawbridge & Clothier department store, to Jones & Laughlin Steel Corporation.
 PHILADELPHIA, 500 tons, Powelton Avenue tunnel bridge for Keystone State Corporation, to American Bridge Co.
 NORFOLK & WESTERN RAILROAD, 690 tons, bridge at Hiawassa, Va., to American Bridge Co.
 BARTOW, FLA., 350 tons, Southern Phosphate Co., to Nashville Bridge Co.
 NEW ORLEANS, 300 tons, river crossing towers for Phoenix Utility Co., to Nashville Bridge Co.
 STATE OF INDIANA, 3200 tons, transmission towers for Northern Indiana Public Service Co., to McClintic-Marshall Co.
 LOUISVILLE & NASHVILLE RAILROAD, 225 tons, bridge work, to American Bridge Co.
 CHICAGO, 400 tons, mill building for Wisconsin Steel Co., to Lakeside Bridge & Steel Co.
 CHICAGO, 180 tons, St. Gertrude's Church, to Midland Structural Steel Co., local.
 CHICAGO, 2000 tons, superstructure for

Lawson Memorial Y. M. C. A., to American Bridge Co.
 CHICAGO, 1600 tons, transmission towers for Illinois Power & Light Co., to McClintic-Marshall Co.
 BAGNELL, MO., 2000 tons, dam construction bridge, to Missouri Valley Structural Steel Co.
 ST. LOUIS-SAN FRANCISCO RAILROAD, 545 tons, bridges, to Virginia Bridge & Iron Co.
 CHICAGO, BURLINGTON & QUINCY RAILROAD, 370 tons, Tenth Street viaduct at Omaha, to Vierling Steel Works.
 SAN FRANCISCO, 400 tons plates, Standard Oil Co., to unnamed Eastern bidder.
 SAN FRANCISCO, 350 tons plates, underground tanks for Shell Oil Co., to Western Pipe & Steel Co.
 SAN FRANCISCO, 100 tons, factory for Nason Paint Co., to Western Iron Works.
 LOS ANGELES, 110 tons, factory for West Coast Glass Co., to McClintic-Marshall Co.
 LOS ANGELES, 215 tons, junior beams, South Gate High School, to Jones & Laughlin Steel Corporation.
 HONOLULU, 250 tons, garage for Kahalia Railroad, to California Steel Co.
 HONOLULU, 265 tons, three buildings for Libby, McNeil & Libby, to Honolulu Iron Works.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

BOSTON & MAINE RAILROAD, 1500 tons, bridge at Goffs Falls, N. H.
 NEW YORK, 5000 tons, pier shed for Munson Lines.
 NEW YORK, 2000 tons, apartment building, Christopher and Fourth Streets.
 YORKTOWN, N. Y., 2000 tons, arch bridge.
 CAMDEN, N. J., 1000 tons, building for Victor Talking Machine Co.
 PHILADELPHIA, 500 tons, General Hospital.
 SCRANTON, PA., 2000 tons, post office.
 PENNHURST, PA., 400 tons, Nurses' Home for State Hospital; bids open Feb. 28.
 SAN ANTONIO, TEX., 4000 tons, hangars for United States Army; Belmont Iron Works low bidder.
 CHARLESTON, W. VA., 3500 tons, State Capitol.
 WEIRTON, W. VA., 2000 tons, mill building for Weirton Steel Co.
 PITTSBURGH, 1300 tons, Moss Side Boulevard viaduct, at Turtle Creek.
 NICKEL PLATE RAILROAD, 750 tons, bridge at Angola, N. Y.
 STATE OF NORTH CAROLINA, 600 tons, highway bridges.
 ALABAMA CITY, ALA., 1650 tons, sheet mill for Gulf States Steel Co.
 AUBURN, ALA., 650 tons, four buildings for Alabama Polytechnic Institute.

CINCINNATI, 1300 tons, building for Fifth-Third Bank & Trust Co.
 CLEVELAND, 350 tons, new plant for Chain Products Co.
 TOLEDO, 600 tons, police headquarters.
 TOLEDO, 300 tons, building for Toledo University; revised bids asked.
 RACINE, WIS., tonnage unstated, Court House; Holabird & Root, architects.
 ST. PAUL, MINN., 6000 tons, bank building; Graham, Anderson, Probst & White, architects.
 CHICAGO, 375 tons, building for Walker Vehicle Co.
 CHICAGO, 3000 tons, addition to Morrison Hotel; Holabird & Root, architects.
 CHICAGO, 6800 tons, grade separation work for railroads entering Union Station.
 TEXAS & PACIFIC RAILWAY, 2650 tons, bridge at Dallas, Tex.
 STATE OF NEW MEXICO, 500 tons, highway bridge.
 SAN FRANCISCO, 640 tons plates, Standard Oil Co.; bids being taken.
 SAN FRANCISCO, 750 tons, Lane Hospital addition; bids soon.

Fabricated Steel Orders Lower in January

WASHINGTON, Feb. 18.—Orders for fabricated structural steel in January totaled 196,368 tons, or 68 per cent of the capacity of the 183 firms, with a capacity of 290,147 tons, which reported to the Department of Commerce. Actual orders in December were 258,715 tons, or 83 per cent of capacity, according to reports received from 214 firms with a capacity of 312,835 tons.

Computed bookings in January totaled 261,800 tons, compared with 319,550 tons in December. Actual orders reported last November were 184,933 tons, while computed orders that month were 227,150 tons.

Computed shipments in January were 257,950 tons, or 67 per cent of capacity, against 277,200 tons, or 72 per cent of capacity, in December. Computed shipments in January were the lowest since February, 1929, when they were 238,700 tons, or 62 per cent of capacity.

Armco Named as Possible Buyer of Gulf States

The American Rolling Mill Co., in answer to an inquiry, informed THE IRON AGE that it had no comment to make regarding reports which have been published in the daily newspapers that it was negotiating for the purchase of the Gulf States Steel Co., Birmingham. Only a little more than a week ago newspaper reports were that the new Republic Steel Corporation was to acquire control of Gulf States, but W. H. Coverdale, president of the latter company, denied that any company had acquired control, though admitting that Republic may have purchased about 20 per cent of the stock of the company in the open market. Mr. Coverdale at the same time intimated that overtures had been made by the American Rolling Mill Co. for the property.

Non-Ferrous Metal Markets

Copper Quiet — Tin More Active—Lead Dull—Zinc Stronger

NEW YORK, Feb. 18

Copper.—Because of the rather unfavorable January statistics, from the producers' viewpoint, both foreign and domestic demand slowed up during the past week. It has, however, turned more active in the last day or two. This is particularly true of foreign demand, sales this morning having been 1000 tons. Demand from abroad thus far this month has totaled about 22,000 tons, which is considerably larger than during January and would be close to what is termed normal if it continued at this rate the rest of the month. Domestic buying is spasmodic, but something is being done each day, all for almost immediate delivery. Very little copper has been bought for March. There is still no indication of any weakening in prices. Electrolytic copper is quoted at 18c., delivered in the Connecticut Valley, and Copper Exporters, Inc., still maintains the price at 18.30c., c.i.f. usual European ports. Reports persist that fabricators of copper are daily improving their total bookings. Lake copper is moderately active at 18c. to 18.12½c., delivered, with sales confined to February delivery. January statistics showed an increase in refined stocks of about 32,000 tons, with a moderate increase in blister copper. Predictions are that February statistics will be much more favorable because shipments are larger this month and production is declining.

Tin.—In a more active market, sales of spot, nearby and future tin were about 1000 tons for the week. The interesting feature is the tight position in spot tin. Because of the very good business in nearby delivery, spot metal is selling at the same price as metal for the first half of March. Under normal conditions, spot tin generally sells at a discount. There is plenty of tin in sight and stocks in London warehouses last week were 14,288 tons, an increase of 451 tons for the week. Prices during the week have held very close to a range of 38.50c. to 39c., spot tin being quoted today at 38.75c., New York. A fair business in nearby was done. London prices today were lower than a week ago. Spot standard was quoted at £173 10s., future standard at £176 10s. and spot Straits at £175 15s. The Singapore price today is £179 2s. 6d.

Lead.—Demand is confined to car-

THE WEEK'S PRICES. CENTS PER POUND FOR EARLY DELIVERY

	Feb. 18	Feb. 17	Feb. 15	Feb. 14	Feb. 13	Feb. 11
Lake copper, New York.....	18.12½	18.12½	18.12½	18.12½	18.12½	18.12½
Electrolytic copper, N. Y.*.....	17.75	17.75	17.75	17.75	17.75	17.75
Straits tin, spot, N. Y.	38.75	38.75	...	38.62½	38.50	38.75
Zinc, East St. Louis.....	5.20	5.15	5.15	5.15	5.15	5.20
Zinc, New York.....	5.55	5.50	5.50	5.50	5.50	5.55
Lead, St. Louis.....	6.10	6.10	6.10	6.10	6.10	6.10
Lead, New York.....	6.25	6.25	6.25	6.25	6.25	6.25

*Refinery quotation: price ¼c. higher delivered in the Connecticut Valley.

Rolled Products

List Prices, Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets—	
High brass	23.25c.
Copper, hot rolled.....	26.75c.
Zinc	10.50c.
Lead (full sheets).....	10.00c.
Seamless Tubes—	
High brass	23.25c.
Copper	29.25c.
Rods—	
High brass	21.25c.
Naval brass	24.00c.
Wire—	
Copper	19.87½c.
High brass	23.75c.
Copper in Rolls.....	26.75c.
Brazed Brass Tubing.....	30.87½c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of Mississippi River and also to St. Louis on shipments to points west of that river.

Sheets, 0 to 10 gage, 3 to 30 in. wide	33.00c.
Tubes, base	42.00c.
Machine rods	34.00c.

Chicago Warehouse

(Prices Cover Trucking to Customers' Doors in City Limits)

Sheets—		Base per Lb.
High brass	23.25c.	
Copper, hot rolled.....	27.75c.	
Copper, cold rolled, 14 oz. and heavier	30.00c.	
Zinc	10.75c.	
Lead, wide	10.30c.	
Seamless Tubes—		
Brass	23.25c.	
Copper	29.25c.	
Brass Rods		21.25c.
Brazed Brass Tubes.....		31.00c.

New York or Cleveland Warehouse

Delivered Prices, Base per Lb.

High brass.....	21.12½c.	to 22.12½c.
Copper, hot rolled, base sizes.....	27.75c.	to 28.75c.
Copper, cold rolled, 14 oz. and heavier, base sizes.....	30.00c.	to 31.00c.
<i>Seamless Tubes—</i>		
Brass	26.00c.	to 27.00c.
Copper	29.12 ½c.	to 30.12 ½c.
Brass Rods	18.87 ½c.	to 19.87 ½c.
Brazed Brass Tubes.....	29.12 ½c.	to 30.12 ½c.

New York Warehouse

Delivered Prices, Base per Lb.

Zinc sheets (No. 9), casks	10.75c. to 11.25c.
Zinc sheets, open.....	11.50c. to 12.00c.

Metals from New York Warehouse

Delivered Prices, Per Lb.

Tin, Straits pig.....	40.25c. to 41.25c.
Tin, bar	42.25c. to 43.25c.
Copper, Lake	19.50c.
Copper, electrolytic	19.25c.
Copper, casting	19.00c.
Zinc, slab	6.50c. to 7.50c.
Lead, American pig.....	7.00c. to 7.50c.
Lead, bar	9.00c. to 9.50c.
Antimony, Asiatic	10.50c. to 11.00c.
Aluminum No. 1 ingots for remelting (guaranteed over 99% pure).....	25.00c. to 26.00c.
Alum. ingots, No. 12 alloy	24.00c. to 25.00c.
Babbitt metal, commercial grade	25.00c. to 35.00c.
Solder, ½ and ½.....	26.75c. to 27.75c.

Metals from Cleveland Warehouse

Delivered Prices, Per Lb.

Tin, Straits pig.....	43.25c.
Tin, bar	45.25c.
Copper, Lake	19.50c.
Copper, electrolytic	19.25c.
Copper, casting	18.75c.
Zinc, slab.....	7.75c. to 8.00c.
Lead, American pig.....	7.00c. to 7.20c.
Lead, bar	9.25c.
Antimony, Asiatic	16.00c.
Babbitt metal, medium grade.....	18.00c.
Babbitt metal, high grade.....	46.50c.
Solder, ½ and ½.....	28.25c.

Old Metals, Per Lb., New York

Buying prices represent what large dealers are paying for miscellaneous lots from smaller accumulators and selling prices are those charged consumers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible.....	14.75c.	16.25c.
Copper, hvy. and wire	14.50c.	16.00c.
Copper, light and bottoms	12.50c.	14.00c.
Brass, heavy.....	8.00c.	9.25c.
Brass, light.....	6.75c.	7.75c.
Hvy. machine composition	11.25c.	12.25c.
No. 1 yel. brass turnings	9.00c.	9.50c.
No. 1 red brass or compos. turnings.....	10.50c.	11.75c.
Lead, heavy.....	4.75c.	5.25c.
Lead, tea.....	3.75c.	4.25c.
Zinc	2.75c.	3.25c.
Sheet aluminum.....	11.00c.	13.00c.
Cast aluminum.....	10.00c.	12.00c.

load and small lots for early delivery. Some business is being done for March, but the market is not active. There has been some inquiry for April metal, which producers are not willing to sell at present. Prices are very firm at 6.10c., St. Louis. The quotation of the leading interest is still 6.25c., New York, as its contract price.

Zinc.—The feature of the market is the strong position of ore. The price is firmly established at \$37, Joplin, and sales last week were the largest in some time, amounting to 14,110 tons. Production was only about 9000 tons, with shipments about the same. The surplus is therefore reduced to only 15,395 tons, compared with 58,000 tons early in November, 1929. Demand for prime Western zinc is light. During the week there were one or two sellers who parted with some metal at 5.15c., East St. Louis, but today most zinc available at this level has disappeared and the market is practically 5.20c. The stronger ore position, so far as its effect on zinc prices is concerned, is partly offset by the large stocks, which were about 87,000 tons the first of the month, the largest in some time.

Antimony.—In a quiet market in which conditions are unchanged, Chinese metal for spot delivery is quoted at 8.75c., New York, duty paid, with futures at 8c.

Nickel.—Ingot nickel in wholesale lots is quoted at 35c. a lb., with shot nickel at 36c., and electrolytic nickel in cathodes at 35c.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is obtainable at 23.90c. a lb., delivered.

Non-Ferrous Metals at Chicago

CHICAGO, Feb. 18.—Prices are holding except for tin and zinc. Sales are spotty, but in fair aggregate volume. Quotations on old metals are unchanged in a quiet market.

Prices per lb., in carload lots: Lake copper, 18.50c.; tin, 39.50c.; lead, 6.20c.; zinc, 5.30c.; in less-than-carload lots, antimony, 9.75c. On old metals we quote copper wire, crucible shapes and copper clips, 14c.; copper bottoms, 11.50c.; red brass, 11.50c.; yellow brass, 8c.; lead pipe, 4.50c.; zinc, 3c.; pewter, No. 1, 24.50c.; tin foil, 22c.; block tin, 32c.; aluminum, 12.87½c.; all being dealers' prices for less-than-carload lots.

Non-Ferrous Ingot Prices and Orders

CHICAGO, Feb. 17.—Non-Ferrous Ingot Metal Institute reports as below the average prices per pound received by its membership on commercial grades of the six principal mixtures of ingot brass during the 28-day period ended Jan. 31. As there are, as yet, no generally accepted specifications for ingot brass, it must be understood that each item listed below is a compilation representing numerous sales of metal known to the trade by the designation shown but each item, in reality, including many variations in formulas. Until the program of standardizing the principal specifications, now progressing in cooperation with the American Society for Testing Materials, is completed, the following specifications will be understood to refer to "commercial grades."

	Cents
Commercial 80-10-10 (1 per cent impurities)	16.523
Commercial 78 per cent metal....	14.763
Commercial 81 per cent metal....	15.03
Commercial 83 per cent metal....	15.272
Commercial 85-5-5-5	15.53
Commercial No. 1 yellow brass ingot	12.315

On Feb. 1, unfilled orders for brass and bronze ingots and billets on the books of the members of the institute amounted to a total of 9630 net tons. This compares with 9578 tons on Jan. 1.

Deliveries of Non-Ferrous Ingots in January

The combined deliveries of brass and bronze ingots and billets by the members of the Non-Ferrous Ingot Metal Institute for the month of January, 1930, amounted to a total of 6154 tons. Deliveries during the previous five months were as follows: December, 5167 tons; November, 6134 tons; October, 7726 tons; September, 7944 tons, and August, 7864 tons.

Wharton and Mount Hope Railroads Sold

Acquisition of the Wharton & Northern Railroad and the Mount Hope Mineral Railroad from the Warren Foundry & Pipe Corporation by the Central Railroad of New Jersey for \$1,250,000 has been approved by the Interstate Commerce Commission. The railroads will be taken over by the new ownership on March 1. The Wharton & Northern has 23 miles of track and the Mount Hope Mineral Railroad is 4 miles long, both railroads having been built to serve Wharton furnace and the Mount Hope iron ore mines, control of which is retained by the Warren Foundry & Pipe Corporation.

OBITUARY

HARRY AINSWORTH, president for the past 16 years of Williams, White & Co., Moline, Ill., died on Feb. 6 at

GEORGE N. CLEMONS, president, Victor Saw Works, Inc., Middletown, N. Y., died on Jan. 30.

ADELBERT E. COLEMAN, founder of the Chicago Ornamental Iron Co., Chicago, died Feb. 12. He was for many years president of the Iron League of Chicago and was also president of the Chicago Builders' Building Corporation.

WILLIAM H. BAKER, secretary and purchasing agent for the last 10 years of the N. O. Nelson Mfg. Co., manufacturer and jobber of plumbing supplies, St. Louis, died at his home there recently. He had been connected with the company for 40 years.

ALBERT WARNER PRIEST, president of the Hayton Pump & Blower Co. and of the Eagle Mfg. Co., both at Appleton, Wis.; president of the Green Bay (Wis.) Wire Works, and director of the Four-Wheel Drive Auto Co., Clintonville, Wis., died at his home in Appleton, aged 82 years.

The National Association of Foremen will hold its annual meeting in the Civic Auditorium and Chamber of Commerce, Toledo, Ohio, June 6 and 7. Harry J. Baumker, 316 Tenth Street, Toledo, is the convention secretary.



H. AINSWORTH

Iowa City, Iowa, aged 67 years. After his graduation from Oberlin College in 1884, he associated himself with his father in the management of Williams, White & Co., later becoming vice-president and general manager. In 1918, he organized Moline Forge, Inc., for the production of forging specialties which had been developed under his direction over a period of years.

PERSONAL

FREDERICK A. MELMOTH, recently associated with Thomas Firth & Sons, Sheffield, England, has become technical director of the Detroit Steel Casting Co., Detroit. He will have charge of methods for production of



F. A. MELMOTH

high quality castings and direct the development of special alloy steels. Mr. Melmoth received his technical education at Sheffield University and later became identified with the Brown Bailey Steel works, Sheffield, becoming assistant in the research laboratory. In 1914 he was placed in charge of the night turn of the open-hearth department, and became actively engaged in the production and development of stainless steel under the direction of Harry Brearley. Two years later he became foundry manager of the National Steam Car Co., Chelmsford. In 1918 he joined the staff of Lake & Elliot Co., Braintree, Essex. About four years ago he returned to Sheffield to take charge of the Firth foundry.

E. J. ASHTON, who has been sales manager for the past year of the L. C. Smith Bearings & Parts Co., has been appointed Chicago district manager of Aluminum Industries, Inc., Cincinnati. His territory includes Minnesota, Wisconsin, Iowa and northern Illinois.

H. R. BUNGAY, JR. has been placed in charge of the newly-opened sales office in Syracuse, N. Y., of the Yale & Towne Mfg. Co., for the sale and servicing of its electric industrial trucks, trailers, and other materials handling equipment in the New York State territory.

CHARLES A. HAYNES, for the past five years associated in an executive capacity with the Truscon Steel Co., Youngstown, has been made manager of the transmission structures division.

H. L. BARNES, heretofore secretary and general manager of the American Forge & Machine Co., Canton, Ohio, has been made president and general manager, succeeding H. C. HAIGHT. O. M. ABT is now vice-president and E. C. KEAFER, secretary and treasurer.

GUY E. LOWN, who has been identified with the Massey-Harris Co., Batavia, N. Y., and its predecessor, the Johnston Harvester Co., for more than 32 years, has resigned as assistant to the general manager, effective March 31. Some time later, he plans to engage in business, probably in Batavia.

GEORGE P. TORRENCE, vice-president and manager of the Link-Belt Co. plants in Indianapolis, has been elected first vice-president of the Associated Employers of Indianapolis. The machinery, iron and steel industries in the association are well represented on the newly-elected board of directors, which includes O. B. ILES, head of the International Machine Tool Co., GUY A. WAINWRIGHT, Diamond Chain Co., J. S. HOLLIDAY, Holliday Iron Co., and ROY E. ADAMS, of the J. D. Adams Co.

IRVING LANGMUIR, associate director of the research laboratory of the General Electric Co., has been awarded the Willard Gibbs medal of the Chicago section of the American Chemical Society for 1930 for "fundamental work on atomic hydrogen and on surface relations and also on electrical discharge phenomena; also for his contributions to nearly all branches of physical chemistry and for his presentation of a theory of atomic structure."

E. W. PARGNY, president, American Sheet & Tin Plate Co., Pittsburgh, has left for a short trip to the Hawaiian Islands.

H. H. KNOWLES has been appointed representative in the western territory, with offices in San Francisco, for the Chesapeake Crane Corporation, Baltimore.

HORACE W. MERRIMAN has been made sales manager of the Philadelphia district office of the Alan Wood Steel Co., and H. H. NEEL has become assistant sales manager.

J. R. WEAVER, superintendent of the manufacturing equipment department of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., was guest of honor and principal speaker at the February meeting of the Engineers' Society of Milwaukee and spoke on "Arc Welded Jigs, Fixtures and Machine Tools," illustrating the processes with lantern slides.

MORTIMER ELWIN COOLEY, dean (emeritus) of engineering, University of Michigan, will be the recipient of the Washington award at a reception and dinner to be held in the Grand Ballroom of the Palmer House, Chicago, on Feb. 24. This is an honorary award given by the Western Society of Engineers and a committee representing the Founder Engineering Societies. Its purpose is to recognize



M. E. COOLEY

devoted and preeminent service in the advancement of human progress. The award is being made to Dean Cooley for vision and constructive leadership in the education of the engineer. This award has previously been conferred upon Hon. Herbert C. Hoover, Robert W. Hunt, Arthur N. Talbot, Jonas Waldo Smith, John Watson Alvord, Orville Wright, Michael Pupin and Bion Joseph Arnold.

WALTER HARNISCHFEGGER, vice-president of the Harnischfeger Corporation, Milwaukee, is on his way to Europe on a combined business and pleasure trip. HENRY HARNISCHFEGGER, father of Walter, and president of the company, will take a similar trip in May.

E. KENT HUBBARD, president of the Manufacturers Association of Connecticut, Inc., sailed Feb. 15, to make a personal investigation of European countries with a view to determining present and future sales possibilities for Connecticut manufactures.

JOHN M. STEWART, for 20 years identified with the Pittsburgh office of Hickman, Williams & Co., Inc., has been appointed Pittsburgh resident manager, succeeding L. BLAINE SNOW, who was elected vice-president of the company at a recent directors meeting.

CHARLES MACL. MOSS, who has been assistant manager of the circuit breaker engineering department, Westinghouse Electric & Mfg. Co., East Pittsburgh, has been appointed manager of the engineering department.

ment at the company's South Bend, Ind., works. Mr. Moss is a graduate of the Armour Institute of Technology, Chicago, and has been identified with the Westinghouse company since 1902.

WALTER H. WHITE, superintendent of the open-hearth department of the Duquesne Steel Foundry Co., Coraopolis, Pa., spoke on "Melting Practice for Steel Castings" at a meeting of the Pittsburgh Foundrymen's Association on Feb. 17.

JOHN GORTHY has been appointed superintendent of the Pickands, Mather & Co. interests at Buffalo. These interests include the Interlake Steamship Co., the Ashtabula & Buffalo Dock Co., and the Ashtabula Steamship Co. Mr. Gorthy has been acting as superintendent since the death of W. E. Chilson several years ago, but without official title.

F. F. ELLIOTT, who has been works manager of the Cleveland plant of the Westinghouse Electric & Mfg. Co., has been appointed director of foundry operations of that company at East Pittsburgh, Pa.

N. B. MACNEELY, for a number of years Chicago manager of the building products division of the General Fireproofing Co., and for the last four years in the reinforcing and building products division of Joseph T. Ryerson & Sons, has been made vice-president of Gooder-Henrichsen, Inc., Chicago, which does a general business in building moving, underpinning and shoring.

C. R. WALMSLEY, who has been general manager of the Leader Iron Works, Decatur, Ill., was elected president of this company at the annual meeting of stockholders and directors.

SAM TOUR, vice-president, Lucius Pitkin, Inc., New York, discussed molten salt baths before a meeting of the New Jersey chapter of the American Society for Steel Treating on Feb. 11.

H. A. SANDERSON, purchasing agent of the Wason Mfg. Co., Springfield, Mass., has been appointed arbitrator for his district on questions submitted under the rules of the American Arbitration Association.

LEO MERRYMAN, who has been assistant to the vice-president and general manager of manufacturing for the American Radiator Co., New York, has been appointed manager of the company's Pierce plant, Buffalo. He has been identified with the Radiator company for the past eight years.

L. C. BULLINGTON, recently manager of the Detroit office of the Westinghouse Electric & Mfg. Co., has been appointed general sales supervisor of that company with headquarters at East Pittsburgh. He became identified with the Westinghouse-Church-Kerr organization in

1889, and when that company was merged in 1903 he was transferred to the sales department of the Westinghouse Machine Co., with headquarters in Atlanta, Ga.

WILLIAM B. LAWSON has been elected a director and a vice-president of the Harshaw Chemical Co., Cleveland. For some years he was connected with the International Nickel Co., New York, as general manager of sales. On the merger of that company with the Mond Nickel Co., Ltd., he became general manager of sales of the merged company, the International Nickel Co. of Canada, Ltd.

NORMAN HUSTON, who has been identified for the past 10 years with the New York sales organization of the Alan Wood Steel Co., Conshohocken, Pa., has been appointed manager of sales of the New York district office. He entered the steel industry in 1913 in the engineering department of the Lukens Steel Co. and worked in a number of the operating departments until the World War. He returned to the Lukens company in 1919 as assistant to the superintendent of the 140 and 204-in. mills.

E. J. BYERLEIN, general manager, Milwaukee Foundry Equipment Co., Milwaukee, sailed from San Francisco on a world cruise, Feb. 19.

K. E. HUMBERT, for 14 years engineer on the staff of Perin & Marshall, consulting engineers, New York, has joined the Rustless Iron Corporation of America, Baltimore.

Tool Steel Failures

(Concluded from page 583)

chrome tool steel showed that hardening temperatures of 1550 deg. Fahr. and higher produced some austenite as the hardness decreased with the increased quenching temperature and specimens drawn at around 500 deg. Fahr. lengthened as measured under a precision measuring machine under constant temperature control.

There are three factors that must be controlled in the production of satisfactory cutting tools, said Mr. D'Arcambal, and he covered these in detail. The factors are design, quality of steel used and hardening treatment. In making tests he has been using with success the acid etching test which shows the slag, dirt and oxides in the steel.

Salt Bath Hardening Expensive

In reply to a question Mr. D'Arcambal said that salt hardening of tool steel is expensive because of the replacement cost of pots. He believed salt would be satisfactory for hardening at 2280 to 2300 deg. Fahr. if properly mixed, old salt being combined with the new. While personally he was still partial to open pot hardening, he said that excellent results can be obtained from an electric salt hardening furnace. He did not favor rehardening

when asked if high-speed steel rehardened two or three times is as good as after the first hardening.

One questioner said that his company is using burnishing broaches made of carbon steel so that they can be salvaged by chromium plating and asked if high-speed steel was being successfully chromium plated. Mr. D'Arcambal replied that his company had applied a flash of chromium plating to high-speed tools in his plant but it had not proved successful and reports from other sources indicated that high-speed steel was not being very successfully chromium plated.

Forgings are used for 4-in. and larger blanks for cutters at his company's plant and bar stock for under 4 in., he said in reply to a question and he believed a hammered blank better than bar stock, as the latter lacks toughness. There is no advantage in a long draw or a double draw for high-speed steel, he said.

Reinforcing Steel

Lettings More Than 8000 Tons— New Projects 4200 Tons

INCLUDING 4500 tons for State highway work in Oklahoma, awards of reinforcing steel, at over 8000 tons, were the largest for any week since the early part of November. New projects call for 4200 tons and are mostly in small lots. Awards follow:

BOSTON, 175 tons, Atlantic National Bank, to Republic Fireproofing Co.
NEW YORK, 650 tons, National City Bank Building, 22, William Street, to National Bridge Works.
NEWARK, 700 tons, Haynes Avenue bridge, to Concrete Steel Co.
EVANSTON, ILL., 100 tons, Chandler Store Building, to Inland Steel Co.
JOLIET, ILL., 1000 tons, miscellaneous work for Rock Island Railroad, distributed among Concrete Engineering, Truscon Steel and Kalman Steel Companies.
OKLAHOMA CITY, 4500 tons, for Oklahoma State Highway Commission, to Sheffield Steel Corporation.
SEATTLE, WASH., 1005 tons King County Hospital, to Pacific Coast Steel Co.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

BOSTON, 600 tons, Sears, Roebuck & Co., store addition.
BRENTWOOD, N. Y., 450 tons for State Hospital.
PHILADELPHIA, 1500 tons, Hoyt Street sewer.
PHILADELPHIA, 200 tons, State road sewer.
DAYTON, OHIO, 250 tons, building for Ohio Bell Telephone.
ERIE, PA., 400 tons, filtration plant.
CHICAGO, 106 tons, Western Theological Seminary building; Hegeman & Harris Co., general contractors.
CHICAGO, 200 tons, apartment building on Berry Avenue.
WAUKEGAN, ILL., 100 tons, superstructure for a central station for Waukegan Generating Co.
MANTENO, ILL., tonnage not given. State institutional building.
JACKSONVILLE, ILL., 230 tons, filtration plant.
PORTLAND, ORE., 123 tons, bridge over Klamath River near Keno; bids Feb. 27.
SACRAMENTO, 108 tons, highway work in Siskiyou County; bids opened.

Handling Iron Ore at Lake Erie Ports

Shipments to Consuming Districts of Lake Superior Ore Received During 1929 Season

LAKE SUPERIOR iron ores received during the 1929 season at Lake Erie ports are reported by the Lake Superior Iron Ore Association at a total of 45,772,572 gross tons, an increase of 24 per cent over the 36,956,342 tons of the preceding season. Shipments from the Lake Erie ports, not including shipments to Lake-front furnaces, aggregated 33,557,856 tons, an increase of 23 per cent on the shipments of the preceding season. The dock balance of ore on hand on Feb. 1 was 5,853,864 tons, an increase of about

10 per cent on the balance a year earlier.

The difference between seasons' receipts and seasons' shipments, after allowing for changes in the dock balance, represent the local furnace consumption or additions to furnace stock piles. During the period from April 1, 1929, to Feb. 1, 1930, this item was 10,584,200 tons. This compares with 9,934,092 tons during the same period of the preceding year.

Particulars by ports are shown in the table.

Lake Superior Iron Ores at Lake Erie Ports

To	Dock Balance April 1, 1929	Receipts for Season (a)	Shipments, Season	Dock Balance Feb. 1, 1930
Buffalo (b)	2,470	5,411,640	410,489	25,891
Erie	59,645	1,410,016	1,360,574	121,810
Conneaut	1,320,318	9,670,557	9,164,539	1,794,579
Ashtabula	1,279,618	8,872,566	8,330,204	1,905,266
Fairport	188,090	2,415,771	2,247,665	378,578
Cleveland	922,498	11,148,363	7,679,026	1,098,895
Lorain	60,224	3,847,799	1,976,358	119,901
Huron	343,434	1,183,879	1,171,300	364,959
Toledo	47,051	1,911,981	1,217,701	43,985
Total	4,223,348	45,772,572	33,557,856	5,853,864
Comparative total one year previous	5,568,098	36,956,342	27,279,670	5,310,678

(a) Ore taken by Lake-front furnaces shown only as receipts, not as shipments.
(b) Includes North Tonawanda and Port Colborne.

Has Large Machinery Bookings

United Engineering & Foundry Co., Pittsburgh, in the year ended Dec. 31, 1929, had net earnings after depreciation and taxes of \$1,671,887, compared with \$826,592 in the preceding year.

In making public the earnings, it was announced that the company has about \$5,000,000 of machinery orders on its books. In a normal year the company can handle \$7,000,000 to \$8,000,000 of such business.

Simplified Shovels, Spades and Scoops

Much benefit is reported from the application of the simplified practice recommendation on shovels, spades and scoops. This matter was handled through the commercial standardization group of the United States Bureau of Standards. The most prominent benefits accruing to the indus-

tries manufacturing and handling these commodities are smaller inventories, less capital tied up in slow-moving stock, quicker deliveries and an increase in turnover, according to a recent survey.

Prior to 1923 there were more than 5000 varieties of shovels. Successive conferences reduced the varieties from 5136 to 2178 by June 15, 1927. This reduction was 57 per cent. A survey of production less than a year later showed that more than 96 per cent of the shovels, spades and scoops were being made in conformity with the simplified practice recommendation.

Factory Earnings Better in December

Average weekly earnings in representative New York State factories, as reported by the State Industrial Commissioner, were \$29.75 in December, compared with \$29.54 in November. The figures include all employees in both office and shop and the reports

cover the week including the fifteenth of the month.

While the December figure is higher than that for November, it is otherwise the lowest of 1929 except for January. It is lower also than the \$30.12 for December, 1928, which was the highest monthly figure recorded up to that time. The highest figure in 1929 and the peak to date was \$30.47, reached in September.

Kathner Normalizing Finance in Europe

Announcement is made that the Duraloy Co., Pittsburgh, has made arrangements with A. T. Kathner and P. Damiron, consulting engineers, 26 Rue Bayard, Paris, France, to furnish the necessary service and technical information to European builders of the Kathner normalizing furnace. These arrangements were made by T. R. Heyward, president of the Duraloy Co., on a recent business trip to England and Continental Europe from which he has just returned.

Mr. Kathner was at one time associated with the Duraloy Co. in Pittsburgh, while Mr. Damiron was formerly assistant manager of the Forges de Gueugnon, Gueugnon (Saone et Loire), France, at whose plant the first Kathner furnace in Europe was built. Mr. Heyward also states that construction of the two Kathner furnaces has been started in German steel plants and one at the Fiat works at Turin, Italy. The Duraloy Co. is the American representative of Kathner & Damiron.

More Coal Being Mined

Mining of bituminous coal since Aug. 1, 1929, has proceeded at a higher rate than for any coal year since 1926-1927. Through Feb. 8, the total reported by the United States Bureau of Mines has reached 449,510,000 net tons, compared with 436,158,000 tons a year ago and 407,456,000 tons two years ago. Current output is above 11,000,000 tons a week, the total for the three most recent weeks having been 34,267,000 tons.

Less Building in January

Building volume during January is reported by the Associated General Contractors of America at 131 (average month of 1913 being 100), a drop of 38 from the December level of 169. While the latest figure is below the 147 of January, 1929, it is well above the 122 and 116 of February and March. Aside from those two months, however, last month's rate of operation is the lowest since February, 1928.

On the annual basis 1929 showed a slight recession from the record total of 1928, but exceeded all earlier years. For 1929 the average was 195, compared with 197 in 1928, 187 in 1927, and 180 in 1926.

Mechanical Equipment Sales and Shipments

	January, 1930	December, 1929	January, 1929
Mechanical stokers sold (a), number.....	54 (b)	79	97
do., horsepower	13,607 (b)	44,976	42,392
Foundry equipment orders (c).....	160.1 (d)	208.0	180.5
do., shipments	223.6 (e)	201.9	177.3
do., unfilled orders	395.6	473.2	336.1
Trackwork shipments (f), net tons.....	11,830	10,826	10,344

(a) United States Department of Commerce.

(b) Smallest totals for several years.

(c) Foundry Equipment Manufacturers Association; index numbers, based on average shipments of 1922-1924 at 100.

(d) Lowest, except for last November, since July, 1928.

(e) Largest since December, 1928.

(f) American Iron and Steel Institute.

Machinery Markets and News of the Works

Slight Upward Trend in Sales

Machine Tool Business Is Spotty, However, and Indications of Improvement Are Not Well Defined

WHILE there are reports from some industrial centers of a slight upward trend in machine tool sales, the indications of improvement are not well defined.

Metal-working plants continue to show considerable interest in new equipment either for replacement of old machines or for reduction in manufacturing costs, but they are slow in placing orders and probably are awaiting a more definite improvement in their own businesses.

In general, however, there have been some gains in sales as compared with January. A large turret lathe manufacturer expects that its February

sales will show a 20 per cent increase over those of last month.

Railroads and farm implement manufacturers are prominent in purchases at Chicago, while at Cleveland the automotive industry is showing slightly more interest. In the East, the principal buying has been done by the electrical manufacturer at Schenectady, N. Y.

In export trade, the outstanding purchases are for shipment to Russia. The Amtorg Trading Corporation, New York, which buys for the Soviet Government, has recently sent out inquiries for fairly large lots of machines.

New York

NEW YORK, Feb. 18.—Although prospective buyers of machine tools are showing increased interest in new equipment there is still considerable hesitancy in placing orders until business develops a more decided improvement. Manufacturing fields which depend upon building for new business are rather quiet but are awaiting spring construction. For instance, a large maker of electric refrigerators has recently been operating at only 10 to 15 per cent of capacity, while last spring the same manufacturer was selling refrigerators in excess of its monthly output. The General Electric Co. has begun to buy against its list of about 10 machine tools for Schenectady, N. Y. No action has been taken as yet by either the New York Central or the Delaware, Lackawanna & Western railroads in purchasing against current lists of tools.

Theurer Wagon Works, Inc., Tenth Avenue and Fifty-sixth Street, New York, manufacturer of custom motor truck and automobile bodies, has acquired four-story factory on Hudson Boulevard, North Bergen, N. J., totaling 100,000 sq. ft. floor space, for a new plant. Present works will be removed to new location and additional equipment installed. Purchasing company is said to be planning addition to existing unit to cost over \$50,000. John Theurer heads organization.

Bloch & Hesse, 18 East Forty-first Street, New York, architects, will take bids at once on general contract for six-story automobile service, repair and ga-

rage building, to cost \$150,000 with equipment.

Board of Trustees, Industrial Institute, Inc., 26 Court Street, Brooklyn, has taken title to 300 acres near Toms River, N. J., as site for new industrial training station, primarily for Diesel engine instruction, to cost about \$1,000,000 with equipment.

Brooklyn Borough Gas Co., 1721 Sheepshead Bay Road, Brooklyn, has awarded general contract to Prosnitz & Glover Co., 369 Lexington Avenue, New York, for two-story and basement equipment storage and distributing plant, including mechanical shop, automobile service and garage, to cost about \$275,000 with equipment. Bloch & Hesse, 18 East Forty-first Street, New York, are architects; C. E. Smith, 116 West Thirty-ninth Street, New York, is engineer.

American Brass Co., Waterbury, Conn., is considering an addition to wire and cable plant at Hastings-on-Hudson, N. Y., to cost over \$500,000 with equipment. W. A. Whitaker is local manager.

Diel Watch Case Co., 311 Grand Street, New York, has leased space in building at 395 Fourth Avenue for new works, and will remove to that location, where capacity will be increased.

Continental Can Co., 1 Pershing Square, New York, plans early operation of new plant at Jacksonville, Fla., to manufacture tin containers, initial unit to represent investment of more than \$100,000.

Plans have been authorized by Mohawk Carpet Mills, Inc., Amsterdam, N. Y., for steam power plant to cost over \$100,000 with equipment. C. W. Becker, Elm Street, is architect and engineer.

Farber & Kalkin, 1746 Pitkin Avenue, Brooklyn, architects, have plans for multi-story automobile service, repair and garage building, to cost over \$350,000 with equipment.

Rubel Coal & Ice Corporation, 937 Fulton Street, New York, has awarded general contract to Gustav Jensen, 8124 Eleventh Avenue, for one-story ice-manufacturing plant, to cost about \$100,000 including machinery.

New York City Airport, Inc., 72 Broadway, Flushing, L. I., has plans for local airport, on property recently acquired, including hangars, repair shops, oil storage and other units, to cost over \$400,000 with equipment. Peter M. Coco, 3304 Grand Avenue, Astoria, L. I., is architect.

William Buckner, 732 Communipaw Avenue, Jersey City, N. J., operating an automobile and brake service and repair works, has purchased additional property, 20 x 106 ft., and will raze existing structure for an addition, to cost over \$40,000 with equipment.

Eberhard Faber Rubber Co., 62 Hoyt Street, Newark, has plans for four-story addition, to cost over \$100,000 with equipment. Enbro Corporation, 111 Academy Street, is architect and engineer.

Board of Education, Board of Education Building, Green Street, Newark, is asking bids on general contract for a new school of fine and industrial arts, to cost over \$300,000 with equipment. William O. Betelle, 20 Branford Place, is architect. R. D. Argue is secretary.

Mason & Co., 397 Market Street, Newark, manufacturer of games, novelties, etc., have leased part of factory at 396 Frelinghuysen Avenue for new plant, increasing present capacity.

Pennsylvania Dock Co., 25 Church Street, New York, affiliated with Pennsylvania Railroad Co., Pennsylvania Station, has plans for second unit of cold storage and refrigerating plant on Hudson River, Jersey City, N. J., to be eight stories, to cost over \$1,000,000 with equipment. First unit is now in course of construction and a third unit will be built later. Terminal Development Co., 25 Church Street, is architect and engineer.

Barclay Mfg. Co., North Bergen, N. J., manufacturer of metal toys, has leased two-story factory at 934-40 Hoboken Street, totaling 12,500 sq. ft. floor space, and will remodel for new plant.

Buffalo

BUFFALO, Feb. 17.—Olean Metal Cabinet Works, Inc., Olean, N. Y., has plans for a new unit, to cost more than \$250,000 with equipment. A. W. E. Schoenbery, Olean, is architect.

L. R. James, Silver Springs, N. Y., and T. C. James, Edgewater, N. J., have acquired controlling interest in Lucas Rule Co., with local plant for manufacture of metal and other rules, and kindred specialties, and will take over property at once. First-noted will be head of company. Plant will be continued at

present location and expansion carried out.

John S. Maxon Co., Inc., Syracuse, N. Y., has been organized with capital of \$100,000 to take over and expand company of same name, with local plant at 239 East Water Street for manufacture of mechanical appliances and equipment. New company is headed by John S. Maxon and Clarence W. Sharkey.

Crystal Ice & Storage Co., 636 Spring Street, Buffalo, is planning addition to plant, to cost over \$70,000 with equipment. A. C. Bishop, 2199 Ashland Road, Cleveland, is architect and engineer.

Amish Truck & Crane Service, Inc., Rochester, N. Y., has been organized by George Amish and associates, to take over and expand company of same name, with local works at 648 Mount Read Boulevard.

Contractors Ornamental Steel Co., 860 Seneca Street, Buffalo, has work under way on one-story addition, to be used as an assembling shop.

Onelda Coach Corporation, care of H. E. Bean, 205 Gridley Building, Syracuse, N. Y., is planning an automobile service and garage building at Onelda, N. Y., for motor buses, to cost about \$75,000 with equipment.

Geneva Body Corporation, Geneva, N. Y., manufacturer of automobile bodies, has arranged for increase in capital from \$155,000 to 1550 shares of stock, no par value, for expansion.

New England

BOSTON, Feb. 17.—New England metal-working plants generally are operating on reduced weekly schedules, with a surplus of skilled mechanics. The past week has been one of the duller dealers have experienced so far this year with a decided falling off in inquiries. However, certain dealers anticipate closing business before the end of February which has been pending for some time.

Small tool sales have fallen off this month, but users are taking tools that have been on order books for many weeks.

Anderson Sheet Metal Co., Providence, R. I., has started work on a one-story shop, 76 x 105 ft.

N. D. Cass, Athol, Mass., manufacturer of toys, has plans for a three-story plant, 60 x 100 ft., to be built in May.

Granville Brothers Aircraft Corporation, Springfield, Mass., is considering plans for a manufacturing plant. A machine shop and equipment will be needed.

O. K. Tool Co., Shelton, Conn., has started work on a one-story, 80 x 180 ft., and four-story, 20 x 40 ft., additions. Equipment has not yet been purchased.

Eastern Mfg. Co., Providence, will start work about March 1 on a one-story and basement manufacturing building, 78 x 173 ft., to cost \$50,000 without equipment.

Rising Paper Co., Housatonic, Mass., will have plans ready about May 1 for a three-story finishing plant, 80 x 170 ft., to cost \$100,000 with equipment. Electrical and other equipment will be purchased.

City of Boston is about to award a contract for a power plant in Mattapan district to cost about \$275,000 with equipment, including charging and conveying machinery.

City of Worcester, Mass., has revised plans for a two-story and basement junior high school, to cost \$450,000 with

equipment. It will contain four manual art departments, and possibly a testing department.

Westerly, R. I., will soon close bids on a two-story junior high and industrial school, 160 x 338 ft., to contain metal working shops, to cost \$500,000.

City of Holyoke, Mass., will build a hydroelectric plant to cost \$500,000 with equipment. Electrical and crane equipment is under consideration.

Boston Hupmobile Co., 97 Massachusetts Avenue, Boston, representative for Hupp Motor Car Co., has leased two-story building, 70 x 300 ft., to be erected at 1055 Commonwealth Avenue, for new service, repair and sales building, to cost \$200,000 with equipment. General contract has been let to Chase & Gilbert, Inc., 31 St. James Avenue.

Wilcox, Crittenden & Co., South Main Street, Middletown, Conn., manufacturers of marine and heavy hardware, have begun superstructure for one-story foundry, 100 x 180 ft., to cost over \$75,000 with equipment. Lockwood Greene Engineers, Inc., 24 Federal Street, Boston, is architect and engineer.

Raybestos-Manhattan Co., Bridgeport, Conn., manufacturer of automobile brake lining, etc., has purchased control of Wright & Corson Co., Milford, Conn., manufacturer of rivet and rivet-setting machinery and equipment, and will operate as a subsidiary.

Superior Spring & Mfg. Co., Washington Street, Hartford, Conn., manufacturer of steel springs, etc., has asked bids on plans for two-story addition, 60 x 130 ft., to cost over \$50,000 with equipment. G. L. Dunkelberger, 721 Main Street, is architect; C. Shultz, 118 Sheffield Avenue, New Haven, Conn., is engineer.

New England Telegraph & Telephone Co., 50 Oliver Street, Boston, has leased one and two-story building, 75 x 240 ft., to be erected at Walnut and South Water Streets, for equipment service and distribution, including automobile service and repair unit, with garage, to cost over \$150,000 with equipment. W. A. Dykeman, 10 Devonshire Street, is architect.

South Atlantic

BALTIMORE, Feb. 17.—Davison Chemical Co., Baltimore Trust Building, Baltimore, has approved plans for new fertilizer manufacturing plant at Houston, Tex., to cost close to \$600,000 with machinery.

Firestone Tire & Rubber Co., Akron, Ohio, has plans for new three-story factory branch and distributing plant at Baltimore, to cost about \$200,000 with equipment.

Gulf Refining Co., Frick Annex, Pittsburgh, has filed plans for new oil storage and distributing plant at Fairfield, Curtis Bay, Baltimore, to include facilities for handling 350,000 gal. at one time, with one-story machine shop, boiler plant and other units, to cost about \$150,000 with equipment.

Virginia Electric & Power Co., Richmond, Va., has authorized immediate expansion and improvement program to cost \$4,800,000, including additions in power facilities, transmission lines and distributing systems; connection will be made with high-tension lines of Carolina Power Co., at Roanoke Rapids, N. C.

Planters' Fertilizer & Phosphate Co., Greenville, S. C., is considering rebuilding part of mill destroyed by fire Feb. 8.

Potomac Electric Power Co., Fourteenth and C Streets, Washington, has

plans for five-story equipment storage and distributing plant, with meter repair and other mechanical departments, to cost about \$250,000 with equipment. A. B. Heaton, 1211 Connecticut Avenue, N. W., is architect.

St. Paul Garage Co., Light and Redwood Streets, Baltimore, has awarded general contract to Consolidated Engineering Co., 20 East Franklin Street, for three-story and basement service, repair and garage building, to cost about \$750,000 with equipment. Company has arranged for preferred stock issue in amount noted, proceeds to be used for project. Wyatt & Nolting, Keyser Building, are architects.

Board of Education, Columbus, Ga., has taken bids on general contract for a one and two-story addition to industrial high school, 65 x 125 ft., and plans to begin work soon. T. Firth Lockwood, Murrah Building, is architect.

United Shank & Findings Co., Whitman, Mass., a subsidiary of United Shoe Machinery Corporation, Boston, has purchased property at Savannah, Ga., for new plant to manufacture shoe shanks, etc., to cost \$100,000 with machinery.

Shell Petroleum Corporation, Shell Building, St. Louis, is planning an expansion program at Atlanta, Ga., and vicinity to cost more than \$750,000, including oil storage and distributing plants and other facilities. Company recently began operations in this territory.

State Highway Department, Columbia, S. C., has asked bids on general contract for equipment maintenance and repair shops at Conway and Dillon, including machine and forge departments, to cost over \$65,000 with equipment. B. M. Sawyer is highway commissioner.

Philadelphia

PHILADELPHIA, Feb. 17.—Philip Carey Co., Lockland, Ohio, manufacturer of roofing materials, insulation products, etc., has purchased seven acres at Fifty-eighth Street and Schuylkill River, Philadelphia, as site for new branch plant, to cost over \$350,000 with equipment. Plans will be prepared soon.

Barrett Co., Thirty-sixth Street and Grays Ferry Avenue, Philadelphia, manufacturer of roofing products, etc., is asking bids until Feb. 24 for two and three-story addition, to replace, in part, recent fire loss, to cost over \$150,000 with equipment.

Jacquard Knitting Machine Co., Inc., 1924 Hunting Park Avenue, Philadelphia, has taken bids on general contract for new plant unit, one story, 75 x 216 ft., to be used primarily as a machine shop, with service and garage unit adjoining, 30 x 65 ft., to cost over \$80,000 with machinery. Charles F. Schaefer, 11 South Sixteenth Street, is architect.

Department of Public Safety, room 215, City Hall, Philadelphia, is asking bids until Feb. 28 for about 100 iron posts, complete with channel plate washers, iron anchors, etc., for street signs. Lemuel B. Schofield is director.

Pennsylvania Railroad Co., Philadelphia, has awarded general contract to Sinclair & Grigg, 1518 Walnut Street, for addition to engine house at South Philadelphia terminal yard, including additional shop facilities, to cost \$100,000 with equipment.

Bendix & Steinmetz, 350 North Second Street, Philadelphia, operating an automobile engineering and repair works, have leased two-story building at 472

York Avenue for new plant and will remove to new location.

Trenton Potteries Co., Clinton and Ott Streets, Trenton, N. J., manufacturer of sanitary ware, has asked bids on general contract for a five-story and basement addition, side and rear, 63 x 195 ft., and 63 x 168 ft., respectively, to cost over \$175,000 with equipment. Lockwood Greene Engineers, Inc., 100 East Forty-second Street, New York, is architect and engineer.

RCA Victor Co., Camden, N. J., manufacturer of talking machines, radio equipment, etc., is planning an expansion and improvement program to cost about \$7,500,000, of which about \$5,000,000 will be used for new multi-story addition to occupy entire block for manufacture of radio parts and assembling. Plants heretofore operated by General Electric Co., Schenectady, and by Westinghouse Electric & Mfg. Co., East Pittsburgh, will be removed to Camden, where Radio Corporation of America, Inc., will concentrate production in future, including manufacture of RCA radiolas, heretofore manufactured at General Electric and Westinghouse plants.

Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., manufacturer of hydraulic presses, rolling mill machinery, special machinery and parts, has asked bids on general contract for one-story addition, to cost about \$40,000 with equipment.

State Board of Education, State House, Trenton, N. J., will soon begin construction of two-story and basement trade school, 120 x 175 ft., for colored youths at Bordentown, N. J., to cost close to \$200,000 with equipment. Guilbert & Betelle, 20 Branford Place, Newark, N. J., are architects.

Capitol Body & Fender Works, 1108 Division Street, Trenton, N. J., has superstructure under way for a new one-story plant to provide increase in output.

Department of Property and Supplies, Capitol Building, Harrisburg, Pa., B. E. Taylor, secretary, will receive bids until Feb. 28 for new electric generating unit, water heater and combustion control equipment for power plant at Wernersville State Hospital, Wernersville. William H. Dechant & Sons, Reading, Pa., are engineers; also for power house at State Teachers' College, East Stroudsburg, Pa. Plans and specifications at office of Frank St. Clair, Jr., chief engineer of construction, Department of Property and Supplies.

Special dies, jigs, fixtures, gages, tools and machinery will be designed for manufacturers by United Engineering & Tool Co., 3160 Kensington Avenue, Philadelphia, according to an announcement by W. D. Dodenhoff, president. New service will be offered to companies interested in improved processes and work systems for increasing production or reducing costs.

Chicago

CHICAGO, Feb. 17.—This market is spotty. Some sellers find February sales not far from normal while others report transactions slow, but with inquiry favorable to a quickening in business. Deliveries, though somewhat improved, are often an important factor in this market in which many buyers do not ask for prices until their needs for machine tools are close at hand.

Santa Fe is purchasing against its recent list and is now asking for bids on a

The Crane Market

INQUIRIES for electric overhead cranes are increasing and there are a number of requests for estimates on the cost of installations, which have not yet reached the stage of a formal inquiry. Certain of these projects will require two or more cranes. In the past week, two lists of overhead cranes have been closed. The Maine Seaboard Paper Co., Bucksport, Me., has placed a 15-ton, 86-ft. span electric crane with the Chesapeake Crane Co. and eight hand power cranes with the Reading Chain & Block Corporation. The Warren Foundry & Pipe Co., Phillipsburg, N. J., has closed with an unnamed builder on a 6-ton, 8-ton, 12-ton and 15-ton hand power cranes, two 5-ton hand power cranes with air hoists and a 15-ton, 86-ft. span electric crane for a new plant at Everett, Mass. The Delaware, Lackawanna & Western Railroad has purchased two 25-ton overhead cranes from the Whiting Corporation.

Locomotive crane inquiry is good, and some substantial business has been closed. The largest purchase of locomotive cranes, which has been made for some months was five 40-ton and two 20-ton placed last week by the Amtorg Trading Corporation, New York, for export to Russia. Other recent purchases include a 10-ton crawl-tread crane by the Keep Construction Co., Elizabeth, N. J., and a 10-ton crawl-tread crane by the Merritt-Chapman & Scott Corporation, New York, from the Browning Crane Co., a 25-ton locomotive crane for the Allied Light & Power Co., by Stevens & Wood, New York, reported bought from Industrial-Brownholst Corporation. The Central Railroad of New Jersey is reported taking bids on a 20-ton locomotive crane. The Atchison, Topeka & Santa Fe Railroad has closed with the Orton Crane & Shovel Co. for a 30-ton gasoline driven crane for Wellington, Kan.

2½-in. x 20-in. x 2-in. bore double-floor grinder, two 2-in. x 14-in. x 1¼-in. bore double-floor grinders and a 100-ton driving box press. Chicago & North Western will buy a heavy face grinder. Sizable purchases are being made against lists recently issued by the International Harvester Co., and the farm implement manufacturer at Charles City, Iowa. Used machine tool market is quiet with a greater number of good tools now available.

Foote Brothers Gear & Machine Co., 111 North Canal Street, Chicago, is planning construction of new unit to be given over largely to production of road-building machinery and parts, including assembling department. Company is arranging for increase in capital from 250,000 to 500,000 shares of stock, majority of fund to be used for expansion.

Woodward Governor Co., Mill Street, Rockford, Ill., manufacturer of engine governors, etc., has plans for two-story addition, 70 x 160 ft., to cost more than \$65,000 with equipment, and will begin superstructure late in spring. Frank A. Carpenter, Brown Building, is architect. Walter T. Woodward is secretary and treasurer.

Grant Storage Battery Co., 226 North Second Street, Minneapolis, manufacturer of electric storage batteries, has work under way on one-story plant, 200 x 300 ft.

City Council, Fairfield, Iowa, is planning a municipal airport, including hangars, repair and reconditioning shops, and other units, to cost about \$65,000. A. A. Reichstein, City Hall, is city engineer.

McFarlane - Eggers Machinery Co., Twenty-seventh and Blake Streets, Denver, has acquired adjoining property and contemplates one-story addition to foundry and machine shop, to cost about \$35,000 with equipment.

Advance Machine Co., 4641 Ravenswood Avenue, Chicago, has plans for a one-story addition to machine shop, 15 x 113 ft., to cost about \$28,000 with equipment.

Southeastern Illinois Gas Co., operated by Utilities Gas & Electric Co., 22 West Monroe Street, Chicago, is considering construction of artificial gas plant and system at Carmi, Ill., to cost about \$125,000. Similar plants are contemplated at Metropolis and El Dorado, Ill., each to cost about \$100,000.

Ellerbe & Co., Endicott Building, St. Paul, Minn., architects, have plans for a six-story automobile service, repair and garage building, to cost about \$400,000 with equipment.

Four-Wheel Automatic Hydraulic Jack Corporation, Chicago, has purchased two-story and basement factory at 3845 Ravenswood Avenue, totaling 85,000 sq. ft. floor space, for new plant.

Cullen Co., Clinton, Iowa, manufacturer of smokestacks, boilers and tanks, is preparing an expansion program and has purchased Mississippi Valley Stove Works, Fulton, Ill., across river from present plant, and will move there early in spring. Another industrial company will occupy Cullen plant in Clinton.

Pittsburgh

PITTSBURGH, Feb. 17.—The machinery trade in this district continues to improve. Business thus far in February is generally ahead of the corresponding period last month and, with most dealers, fully equal to the first half of February, 1929. The Westinghouse Electric & Mfg. Co. is buying steadily against its first quarter inquiry, and the American Austin Car Co., Butler, Pa., has placed a number of tools for its automobile manufacturing plant which will likely be in operation in two or three months. At present the company is purchasing tools for a production of 50 cars daily, but the plant is being laid out for an output of 500 cars daily and the company will probably be a much larger buyer of equipment in a short time.

New inquiry from the railroads is still lacking, but the Baltimore & Ohio has purchased a few tools and dealers are counting on a large list for the Pennsylvania in a few weeks. Orders for heavy machinery and equipment are still reaching local builders, and one large interest has sufficient orders for this type of equipment to keep it operating at capacity for nearly a year.

Wolverine Empire Refining Co., Reno, near Franklin, Pa., has authorized an expansion and improvement program at local Empire oil works, including installation of additional equipment, to cost over \$100,000. Company comprises a recent merger of Empire Oil Works, Inc., Reno, and Wolverine Lubricants Co., 51 Madison Avenue, New York.

H. F. Watson Paper Co., Erie, Pa., manufacturer of insulating paper, cor-

rugated paper products, etc., is considering an addition to cost over \$160,000 with machinery.

Plans have been arranged for a merger of Fort Pitt Spring Co., and Duer Spring & Mfg. Co., manufacturers of steel springs, both with plants at McKees Rocks, Pa., and spring department of Standard Steel Car Co., Butler, Pa. All plants will be continued in service and expansion carried out. Companies will continue under present identities.

Grant D. Bradshaw, 530 Fourth Avenue, Pittsburgh, and associates have organized Romec Pump Co., to operate a local plant for manufacture of pumping machinery and parts. W. B. Atwood, Avalon, Pa., will be an official of new organization.

Duquesne Light Co., 435 Sixth Avenue, Pittsburgh, is planning automatic power substation at Verona, Pa., to cost over \$75,000 including equipment.

Berwind-White Coal Mining Co., Commercial Trust Building, Philadelphia, has authorized installation of new coal-mining plant at properties near Hartwell, W. Va., including construction of new steel tipples, surface conveying and handling equipment, etc., to cost over \$100,000.

United Fuel Gas Co., Charleston, W. Va., has acquired natural gas leases on property in McDowell and Mingo Counties, W. Va., and Buckhannon County, Va., and plans construction of pipe lines, extending to Welch, W. Va., and vicinity, to cost more than \$250,000 with booster stations, etc.

Elliott-Blair Steel Co., New Castle, Pa., in receivership since last fall, is arranging to resume production at mill under direction of Noah W. Elliott, Sr., and J. R. Foster, receivers, for manufacture of cold-rolled steel.

Milwaukee

MILWAUKEE, Feb. 17.—Machine tool business is slowly climbing upward although it has not reached last year's total for the same period. Several large transactions are yet to be closed. A surplus of skilled labor is attributed to influx from other points and continued dullness in the plants making high-priced automobiles. Manufacturers of small automobiles, motor trucks and accessories and parts have increased production along with tractor manufacturers. Deliveries have not been greatly advanced.

Bicknell Mfg. Co., Janesville, Wis., manufacturer of hardware and mill supplies, will rebuild plant and replace equipment recently damaged by fire, with loss estimated at \$50,000.

Parker Fountain Pen Co., Janesville, has awarded contracts to T. S. Willis Co., local, for addition of extra story to printing plant, remodeling present buildings and installation of new 50,000-gal. tank with sprinkler system, to cost about \$185,000.

Common Council, Elroy, Wis., has authorized purchase of a municipal electric generator with Diesel engine drive. E. E. Brintnall is city clerk.

Common Council, Watertown, Wis., has approved a \$23,000 bond issue for new incinerator plant, on which bids were taken in September, and an award will be made forthwith. A. F. Stallman is city clerk.

Wisconsin Fuel & Light Co., 823 Jay Street, Manitowoc, Wis., has awarded contracts to Walter W. Oefflein, Inc., 110

East Wisconsin Avenue, Milwaukee, for addition to local water-gas generating and boiler plants, to cost \$100,000.

Milwaukee Western Fuel Co., 120 East Wisconsin Avenue, Milwaukee, has let general contract to Klug & Smith Co., Mack Block, for construction of two coal trestles, each 51 x 193 ft., 47 ft. high, with coal hoppers and machinery, to cost about \$17,000 each.

T. L. Smith Co., 1034 Thirty-second Street, Milwaukee, maker of concrete mixers and road machinery, has changed its name and address to National Equipment Corporation, Thirty-third Street and Concordia Avenue. Smith company has been operated for some time as a division of National Equipment organization.

Bucyrus-Erie Co., South Milwaukee, Wis., has received an order for more than \$1,250,000 worth of large revolving shovels to be shipped to nitrate fields in Northern Chile for Anglo-Chilean Nitrate Co. with the first deliveries in May and the last in December. Shovels are 24 in number, each of 4 cu. yd. capacity and are to be electrically operated. Chilean company had previously purchased 23 similar units from same company.

Increases in orders for products of Allis-Chalmers Mfg. Co., Milwaukee, has brought about employment early in February of more men than in 1929 peak period. Since Jan. 1, by adding 600 to the force, company has had at work a total on Feb. 1 of 9101 compared with 8964 last July, peak for 1929. In January, 1929, payroll included 8145 persons.

Cincinnati

CINCINNATI, Feb. 17.—Virtually all lines of machine tools showed some improvement in sales the past week, and the machine tool trade is more optimistic than at any time this quarter. While there was a trend toward purchases of planers and heavy tools, the most marked demand was for lathes. One leading manufacturer of lathes indicated that the past week was surprising in the volume of fresh bookings, especially from Middle West shops. This activity, however, has not reached the proportions of the third quarter and early part of the fourth quarter last year. In general, orders were for one and two machines and were fairly well scattered. Inquiry continues brisk. Production is being maintained at a high rate, but unfilled orders are diminishing rapidly.

Cleveland, Cincinnati, Chicago & St. Louis Railroad Co., Big Four Building, Ninth and Sycamore Streets, Cincinnati, is considering engine house and repair shops at Sharonville, Ohio, to cost about \$90,000 with equipment. H. A. Baldwin is company engineer, address noted.

H. Phillips & Co., 904 Evans Street, Cincinnati, operating a sheet metal works, have awarded general contract to Parkway Construction Co., Provident Bank Building, for one-story addition, to cost about \$30,000 with equipment.

Golden Eagle Aircraft Co., Los Angeles, has secured property at Columbus, Ohio, for establishment of plant to manufacture light monoplanes, including parts and assembling departments, to cost more than \$40,000. Present works will be removed to new location and capacity increased.

City Council, Nashville, Tenn., is planning extensions and improvements in municipal electric light and power plant, including installation of additional equipment, to cost over \$65,000.

State Department of Public Welfare, Columbus, Ohio, W. H. Griswold, director, has revised plans for power plant, including equipment, at State sanitarium, Applecreek, to cost over \$75,000. T. Ralph Ridley is State architect in charge.

Harris-Thomas Drop Forge Co., 126 Harshman Street, Dayton, Ohio, contemplates a one-story addition, to cost over \$30,000 with equipment.

East Kentucky Southern Railway Co., Grayson, Ky., is considering one-story locomotive repair shop, 50 x 65 ft., to cost about \$25,000. W. I. Webber is manager.

Mississippi Valley Barge Line Co. has begun construction on the first of several river terminals in Cincinnati, involving an investment of \$500,000. A. B. Boyer and Harris Armstrong, St. Louis, are architects and engineers.

Aluminum Industries, Inc., Cincinnati, has awarded contracts for foundations of its new buildings to Fisher-Devore Construction Co., and for superstructure to Truscon Steel Co.

Cleveland

CLEVELAND, Feb. 17.—Machine tool business still shows a slight tendency upward. Orders are mostly for single tools and are coming from scattered sources for replacement needs for production work and for tool-room equipment. Many metal-working plants are showing interest in replacing present equipment with newer and more proficient tools but are inclined to hold off until their business picks up. Chandler Products Corporation, Cleveland, has purchased a large part of the equipment, including automatic screw machines and other tools, for its new plant. A little more activity is being displayed by the automotive industry. The Buick Motor Co. purchased two turret lathes the past week. Some new inquiry for round lots of machines for various Russian projects has come from the Amtorg Trading Corporation. A local turret lathe manufacturer expects its February sales will show a 20 per cent gain over January.

Bonar-Bawter Co., Benton Harbor, Mich., has consolidated with American Fan Form Co., Cleveland, and will move to Cleveland where it has acquired factory space at Clark Avenue and West Sixty-fifth Street. Company makes fan forms for billing machines and other products.

Chain Products Co., 3924 Cooper Avenue, Cleveland, has plans for one and two-story addition, to cost over \$50,000 with equipment. Richards & Co., Ontario and St. Clair Avenues, are architects and engineers.

Westinghouse Electric & Mfg. Co., East Pittsburgh, is arranging for enlargements in plant on West Fifty-eighth Street, Cleveland, and will center production of industrial and street-lighting equipment there in future, including airport lighting apparatus. Present division for such work at South Bend, Ind., will be removed to Cleveland. Cleveland plant has been used largely for foundry service, and parts of such division will be removed to Trafford, Pa., and to transformer plant at Sharon, Pa. A local foundry unit will be continued for manu-

facture of castings for electric household appliance works at Mansfield, Ohio, including range and refrigerator castings. Carl G. Schluederberg, general manager of street-lighting department, will be works manager at new Cleveland plant.

Ohio Ferro Alloy Corporation, Canton, Ohio, contemplates construction of new one-story plant, 80 x 230 ft., near Philo, Ohio, for alloy steel production, to cost over \$100,000 with equipment.

General Incinerator Co., Alliance, Ohio, recently organized by H. L. Bockfinger, Alliance, and associates, plans early operation of local plant for production of refuse burners for domestic service, and kindred products. Mr. Bockfinger will be president; A. A. Mulac is vice-president, and C. J. Rodman, treasurer, all of Alliance.

Bucher & Gibbs Plow Co., Canton, Ohio, is contemplating an expansion and betterment program, including installation of additional equipment.

Kroehler Mfg. Co., 1644 Doan Avenue, Cleveland, manufacturer of furniture, has plans for three-story factory, to cost about \$175,000 including equipment. J. O. Taylor, Fisher Building, Chicago, is architect and engineer.

Tuscan Rubber Co., Carrollton, Ohio, is considering a one-story addition, 40 x 160 ft., to cost over \$60,000 with equipment.

Gulf States

BIRMINGHAM, Feb. 17.—Texas Pacific Coal & Oil Co., Thurber, Tex., has plans for a new gasoline refinery near Breckenridge, Tex., to cost about \$100,000 with equipment.

City Council, Amarillo, Tex., is considering municipal electric light and power plant, to cost over \$65,000 with equipment.

East Baton Rouge Parish, Baton Rouge, La., will take bids early in March for airport, including hangar, 128 x 140 ft., with shop and repair facilities, two-story administration building, 45 x 110 ft., and other units, to cost over \$70,000 with equipment. Jones, Roessle & Olschner, Raymond Building, are architects.

American Creosote Works, Inc., 1305 Dublin Street, New Orleans, will soon begin construction of plant near Jackson, Tenn., to include power house, pumping station, tram cars, conveying and other mechanical-handling equipment, to cost about \$200,000. C. O. Cooper, 7601 Frexet Street, New Orleans, is engineer.

West Texas Utilities Co., Abilene, Tex., will soon start work on one-story ice-manufacturing plant at Memphis, Tex., to cost about \$60,000 with machinery.

Orleans Parish School Board, City Hall Annex, New Orleans, plans installation of manual training equipment and science laboratories in new four-story high school to cost over \$300,000, for which bids will be received on general contract March 7. E. A. Christy is supervising architect for school board.

J. E. Taylor, 700 North Alcaniz Street, Pensacola, Fla., is at head of project to construct and operate local plant to manufacture tile products, initial unit to cost about \$100,000 with machinery.

Texas Cities Gas Co., Waco, Tex., is planning an expansion and improvements in local plant and system, including pipe line construction, to cost about \$100,000.

C. J. Finn, Bankers Mortgage Building, Houston, Tex., architect, has asked bids on general contract for four-story and basement automobile service, repair and

garage building, 100 x 175 ft., to cost about \$250,000 with equipment. R. J. Cummins, Bankers Mortgage Building, is engineer.

Airport Committee of City Council, Birmingham, has plans for municipal airport, including hangars, motor repair shop, oil storage and other buildings, to cost over \$175,000 with equipment. H. W. Stanford, Birmingham, is architect.

International Harvester Co., 606 South Michigan Avenue, Chicago, is asking bids on general contract until Feb. 25 for one and two-story factory branch and distributing plant at Sweetwater, Tex., 100 x 300 ft., and 100 x 183 ft. respectively, to include division for assembling, to cost over \$125,000 with equipment. W. D. Price, company headquarters noted, is superintendent of construction.

Shell Petroleum Co., Shell Building, St. Louis, is contemplating oil storage and distributing plant near Crystal Springs, Miss., to cost over \$65,000 with equipment.

Ammex Equipment Co., 406 San Francisco Street, El Paso, Tex., has been appointed by Foote Brothers Gear & Machine Co., Chicago, as district representative in a section of Texas, New Mexico and Mexico, except states of Nuevo Leon and Tamaulipas.

St. Louis

ST. LOUIS, Feb. 17.—Mexico Refractories Co., Greer Building, Mexico, Mo., will soon take bids on general contract for firebrick and refractory plant near city, to cost over \$125,000 instead of smaller amount previously noted. Company is arranging for increase in capital to \$1,000,000.

Missouri Public Service Co., Pleasant Hill, Mo., is disposing of a bond issue of \$900,000, part of fund to be used for extensions and improvements in power plants and system.

Southwestern Cotton Oil Co., East Chickasaw Street, Oklahoma City, Okla., has plans for a one-story addition, 100 x 100 ft., for storage and distribution, to cost about \$30,000 with equipment.

Universal Match Co., Ferguson, Mo., will take bids at once on general contract for two-story plant, to replace factory recently destroyed by fire, to cost over \$85,000 with machinery.

Missouri-Kansas Pipe Line Co., 820 Dwight Street, Kansas City, Mo., is arranging for increase in capital from 700,000 to 5,000,000 shares of stock, \$5 par value, portion of proceeds to be used for extensions in pipe lines in Missouri, Kansas and other states.

Carter-Waters Co., 2049 Main Street, Kansas City, Mo., road-building materials and supplies, has asked bids on general contract for four-story storage and distributing plant, 75 x 100 ft., with foundations to carry two additional floors, to cost more than \$100,000 with equipment. Archer & Gloyd, Pioneer Trust Building, are architects.

City Council, Eldorado Springs, Mo., has plans for a municipal electric power plant, to cost over \$60,000 with equipment. Burns & McDonnell Engineering Co., Interstate Building, Kansas City, Mo., is engineer.

Kansas Power Co., Dodge City, Kan., is disposing of a bond issue to total \$1,000,000, portion of proceeds to be used for expansion and improvements in power plants and system.

Coca Cola Bottling Co., 1115 Clark Avenue, St. Louis, will soon begin superstructure for one and two-story bottling

plant, 130 x 250 ft., Market Street, for which general contract recently was let to Boaz-Kiel Construction Co., Ambassador Building, to cost over \$100,000 with machinery, including automatic bottling equipment, conveying and other machinery. C. F. A. Bruggeman, Liberty Central National Bank Building, is architect.

State Board of Control, State House, Lincoln, Neb., plans power plant on local site to cost about \$65,000 with equipment. Burns & McDonnell Engineering Co., Interstate Building, Kansas City, Mo., is engineer.

St. Louis-San Francisco Railway, Frisco Building, St. Louis, plans call for bids on general contract early in March for engine house and locomotive repair shops at Springfield, Mo., to cost about \$100,000 with tools and equipment.

Laclede-Christy Clay Products Co., 411 North Seventh Street, St. Louis, has plans for improvements and enlargements, including erection of additional tunnel kilns, machine shop and carpenter shop.

Koken Companies, Inc., 3400 Morganford Road, St. Louis, manufacturer of barber supplies, is erecting a foundry addition, 80 x 100 ft., at a cost of \$10,000.

Detroit

DETROIT, Feb. 17.—Robey Speed-Aire Mfg. Co., Mount Clemens, a subsidiary of Dixie & Northern Air Lines, Detroit, is arranging establishment of local plant to manufacture aircraft, including parts department and assembling, to cost over \$40,000 with equipment. Initial facilities will provide for an output of three airplanes weekly. General C. W. Harrah is head of parent organization.

Michigan Public Service Co., Ludington, has arranged for sale of bond issue to total \$1,615,000, part of fund to be used for expansion and improvements.

In connection with expansion and betterments in different parts of State, Consumers Power Co., Jackson, is considering expenditure in Saginaw district of about \$2,700,000, including extensions in steam-operated electric generating plant and completion of coal dock with mechanical handling equipment. In Flint district company will appropriate \$2,270,000 for electric and gas properties, work to include pipe line system, 5,000,000-cu. ft. capacity gas holder and extensions in electric transmission and distributing lines.

O. & S. Bearing Co., 303 Artillery Avenue, Detroit, manufacturer of metal bearings, etc., has awarded general contract to Austin Co. for addition, including improvements in present structure, to cost about \$40,000 with equipment.

Essex Wire Co., Detroit, recently organized with capital of \$1,000,000, has acquired wire-making division of Ford Motor Co., and will operate at once. Plant has been giving employment to about 600 persons, and additional facilities for production will be provided to double this working force. A. E. Holton is president of new company, and H. A. Strickland, vice-president and general manager.

Kelsey-Hayes Wheel Corporation, 3600 Military Drive, Detroit, manufacturer of steel and other automobile wheels, has begun an expansion and improvement program to cost over \$350,000. Work includes extension to one-story press shop to double capacity. J. A. Utley, Penobscot Building, is construction engineer.

Accuralite Co., Sherman Boulevard, Muskegon, manufacturer of engine pistons, etc., contemplates a one-story addi-

tion, to cost over \$25,000 with equipment. Work will begin in spring.

Detroit Public Lighting Commission, 174 East Atwater Street, Detroit, is planning automatic power substation for street railroad, to cost about \$80,000 with equipment. Smith, Hinchman, Grylls, Marquette building, Detroit, are architects and engineers.

Stecker Motor & Armature Co., 2221 Third Street, Detroit, affiliated with Stecker Electric & Machine Co., same address, has arranged for change in company name to Stecker Electric Co. Edwin L. Stecker is one of heads of company.

Indiana

INDIANAPOLIS, Feb. 17.—Muncie Gear Works, Inc., Muncie, is considering one-story addition to cost more than \$30,000 with equipment.

South Bend Tool & Die Works, Inc., 1918 South Main Street, South Bend, has awarded general contract to Clarence Goheen, 811 East LaSalle Street, for a second story addition to present plant, 36 x 60 ft., to cost about \$25,000 with equipment.

Citizens' Gas Co., 47 South Penn Street, Indianapolis, has authorized a call for bids for construction of a new gas container with auxiliary equipment, to cost about \$350,000. C. L. Kirk is vice-president and general manager.

City Council, Anderson, contemplates a municipal airport, with hangar, machine and repair unit, oil storage and other structures, to cost about \$75,000 with equipment. City engineer office will be in charge.

Bendix Aviation Corporation, Bendix Drive, South Bend, has purchased plant and business of Bragg-Kliesrath Corporation, 39-01 Queens Boulevard, Long Island City, N. Y., manufacturer of vacuum booster brakes for motor vehicles, parts, etc., and will consolidate. Acquired company will be operated as a subsidiary and plant will be continued for present at Long Island City. Expansion in output is planned.

Fisher Brothers, 1521 Shelby Street, Indianapolis, electrical equipment and supplies, have acquired local property as site for new storage and distributing plant, to cost over \$30,000 with equipment. Present works will be removed to new location.

Pacific Coast

SAN FRANCISCO, Feb. 13.—Board of Trustees, California Institute of Technology, Pasadena, Cal., has awarded a general contract to W. C. Crowell, 495 South Broadway, for one-story machine shop, 70 x 200 ft., to cost about \$150,000 with machinery. Bertram G. Goodhue Associates, 2 West Forty-seventh Street, New York, are architects.

Pacific Electric Mfg. Co., 5815 Third Street, San Francisco, manufacturer of electrical appliances, has work under way on two one-story shop units, to cost about \$60,000 with equipment. R. E. McLane, address noted, is company engineer.

Board of Education, Los Angeles, has approved plans for one-story vocational shop at high school at Venice, 60 x 130 ft., with divisions for automobile repairs, metal-working and electrical repair and construction, to cost \$25,000. A. S. Nickelbecker, Jr., 1624 Bushnell Street, South Pasadena, Cal., is architect.

Portland Electric Power Co., Electric Building, Portland, has plans for a one-story addition to steam-operated electric power plant, 70 x 100 ft., to cost about \$65,000. Additional equipment will be installed.

Utah Power & Light Co., Salt Lake City, Utah, is disposing of a bond issue of \$4,000,000, part of proceeds to be used for extensions and improvements.

Utah Oil Refining Co., Salt Lake City, has plans for extensions and betterments in oil refinery, including installation of additional equipment, to cost about \$150,000.

Pacific Paper Products Co., Inc., care of A. A. Rogers, president, First National Bank, Eugene, Ore., recently organized by Mr. Rogers and associates, is planning early construction of a local pulp and paper mill, to cost over \$300,000 with machinery. Company is capitalized at \$500,000. P. J. Lamoureux, Eugene, will be manager at mill.

Electrical Products, Inc., 1128 Venice Boulevard, Los Angeles, manufacturer of electrical specialties, has awarded general contract to Bavin & Burch, 178 East Jefferson Street, for second story addition to factory, 45 x 93 ft., to cost about \$30,000 with equipment.

Beaver Portland Cement Co., Lumbermen's Building, Portland, has plans for hydroelectric power house on Rogue River, near Gold Hill, Ore., for service at cement mill in that district. Initial installation with transmission line will cost about \$300,000. F. W. Allen, Railway Exchange Building, Portland, is consulting engineer.

R. N. Nason & Co., 151 Potrero Avenue, San Francisco, manufacturers of paint and varnish, have awarded general contract to George Wagner, 181 South Park Street, for six-story and basement factory addition, 100 x 100 ft., to cost over \$100,000 with equipment. C. H. Snyder, 251 Kearny Street, is engineer.

Alaska Pacific Salmon Corporation, Skinner Building, Seattle, has awarded a general contract to Austin Co., Cleveland, for addition to canning, storage and distributing plant at Kake, Alaska, to cost over \$80,000 with equipment.

Canada

TORONTO, Feb. 17.—Demand for machine tools and general plant equipment is improving. Much of the betterment is due to purchases by the railroads which have a direct bearing on plants and shops making railroad equipment and supplies. The automotive industry is buying more extensively, but almost entirely for replacement needs. A steady flow of single orders is coming from garages and repair plants.

Pittsburgh Water Heater Co., Pittsburgh, Pa., will establish a manufacturing plant in Toronto and will operate under name of Pittsburgh Water Heater Co. of Canada, with head office and factory at 440 Spadina Avenue, under management of Edwin Newsome, former Canadian distributor.

Town Council, Preston, Ont., contemplates purchase of substation transformers and auxiliary equipment to cost \$20,000. E. G. Heise is clerk.

W. Juniper, 176 Simcoe Street, Peterborough, Ont., will build a two-story machine shop and factory and will purchase tools and equipment.

Page Hersey Tubes, Ltd., 100 Church Street, Toronto, contemplates erection of

a \$2,000,000 seamless tube mill at Welland, Ont. Plant will supply pipe for Alberta and Saskatchewan oil fields.

Bids will be called immediately for a one-story plant at Mount Dennis, Ont., for F. N. Burt & Co., Ltd., 420 Wellington Street, Toronto.

Bids will be called in spring for a five-story reinforced concrete plant at Montreal, for Progress Spring Bed Co., Ltd., 988 De Bullion Street. M. E. Coshof, 1485 Bleury Street, is architect.

Equitable Securities Corporation, Ltd., Montreal and Toronto, has acquired James Morrison Brass Mfg. Co., Ltd., Toronto. Company has been in business for over 65 years and manufactures cast iron, steel and brass valves, locomotive and marine equipment, power, plumbing and heating supplies, etc.

Western Canada

British Columbia Electric Railway Co., Carrall and Hastings Streets, Vancouver, B. C., will build five separate power lines from new hydroelectric plant at Ruskin to New Westminster and Vancouver, a distance of 38 miles. J. I. Newall, care of company, is engineer.

A by-law authorizing expenditure of \$33,000 for an additional unit for power plant at Prince George, B. C., has been carried. Equipment required will include a 200 kva., alternating current generator, and one 200-hp. oil engine. V. R. Clerihue, is clerk.

Foreign

WORK is under way by National Cash Register Co., Dayton, Ohio, on new plant near Berlin, Germany, for parts manufacture and assembling, to cost over \$400,000 with equipment.

General Italian Edison Electric Corporation (Societa Generale Italiana Edison di Elettricit ), Milan, Italy, is disposing of a stock issue in United States totaling \$6,160,000, part of fund to be used for extensions and betterments in power plants and system. G. Motta is president and managing director.

Backus Brooks Co., Builders' Exchange Building, Minneapolis, operating Minnesota & Ontario Paper Co., International Falls, Minn., manufacturer of insulating board, has selected property near Helsingfors, Finland, for new mill to manufacture similar specialties, pulp board, etc., reported to cost over \$2,500,000 with machinery.

Ulen & Co., 120 Broadway, New York, contractors, associated with John Monks & Sons, 438 Broadway, engineers, in carrying out reclamation project on Struma and Phillippi Plains, Macedonian section of Greece, for Government of that country, are placing initial orders for dragline excavating machinery and other mechanical equipment to total about \$700,000. Further purchases of machinery later will cost about \$900,000 additional. Entire project will cost \$23,000,000.

New Trade Publications

Rolling Machines.—McKinney Tool & Mfg. Co., 1688 Arabella Road, Cleveland. Bulletins 50 and 51, four pages each, illustrate and describe type "B" and type "C" machines. Type "B" machine is built in two sizes, and the type "C" machine in three standard sizes. Other sizes for unusual conditions can be supplied.

Factory Heater.—Buffalo Forge Co., Buffalo. Folder of four pages illus-

trating and describing "Buffalo Wet-boy"—a new unit heater which moistens the air in addition to heating it.

Circuit Breakers.—Westinghouse Electric & Mfg. Co., East Pittsburgh. Circular 1705B deals with type CL carbon circuit breakers. The booklet is well illustrated and contains complete information concerning manufacture and application of circuit breakers.

Tachometer.—O. Zernickow Co., 15 Park Row, New York. Circular of two pages illustrating and describing the new O-Z Anemo tachometer, weighing 2 lb. It is claimed to show instantaneously the air velocity and its fluctuations in miles an hour and meters a second.

Wearing Parts for Machinery.—American Manganese Steel Co., Chicago Heights, Ill. Bulletin of 8 pages illustrating and describing a variety of uses for manganese steel. Included in the equipment shown are wheels for overhead cranes, dredge buckets, hose clamp couplings, etc.

Saw Sharpeners.—Samuel C. Rogers & Co., Buffalo. Leaflet, 8½ x 11 in., illustrating the company's new fully-automatic ball-bearing grinder for metal and wood-working saws up to 30 in. in diameter.

Portable Electric Tools.—Black & Decker Mfg. Co., Towson, Md. Catalog for 1930, 8½ x 11 in., 40 pages, illustrated. In addition to portable drills, self-reversing tappers, screw-drivers, nut runners, hammers and grinders, several types of Marsche heavy-duty pedestal grinders and buffers are illustrated. Included also are bench and post mounting drill stands and several valve-conditioning machines.

Plant Maintenance and Repairs.—Stone & Tar Products Co., Brooklyn. Vest-pocket booklet of 40 pages, giving instructions for the use of the company's cement filler, calking compound, waterproofing paint, concrete hardener, patching cement, etc. Prices are given.

Milling Machines.—Kearney & Trecker Corporation, Milwaukee. Illustrated booklet, 24 pages, 8½ x 11 in., devoted to production milling problems in the tractor industry. Action photographs show a number of installations of Milwaukee machines.

Architectural Grilles.—Diamond Mfg. Co., Inc., Wyoming, Pa. Illustrated leaflet showing use of Diamond grilles in the Koppers building, Pittsburgh, and the Atlantic City Auditorium.

Surfacing Compound for Gas Holders.—Intertol Co., Inc., 253 Broadway, New York. Eight-page booklet, 8½ x 11 in., with photographs of gas holders painted with Imunol.

Flexible Shaft Equipment.—S. S. White Dental Mfg. Co., 152 West Forty-second Street, New York. Book of 120 pages, 5½ x 8 in., bound in limp kraft cloth. Applications of the flexible shaft drive are discussed and illustrated, and data on efficiency of transmission under various conditions are included. Construction details of the White line are given.

Tungsten-Carbide Lathe.—Porter-Cable Machine Co., Syracuse, N. Y. Catalog of 32 pages, 8½ x 11 in., describes the company's new Carbo-Lathe, several multiple-tool sets-ups being included in the illustrations. An introductory article outlining the characteristics and proper use of tungsten carbide is a feature, and there are charts showing the recommended tool angles for various uses.

Ball Bearings.—New Departure Mfg. Co., Bristol, Conn. Bulletin of 16 pages illustrating and describing N-D seal self-lubricated ball bearings, which keep the lubricant in and the dirt and dust out. They are used for electric motors, small pumps, vacuum cleaners, portable electric or air-driven tools, etc.

Nickel Steel.—International Nickel Co., New York. Pamphlet No. 14 on Nickel Steel, data and applications, is a reprint of a paper before the American Society of Mechanical Engineers, entitled "The Manufacture of Nickel Steel Plate," by Charles McKnight and W. G. Humpton. It is an eight-page illustrated pamphlet.

The Week's News Quickly Told

Current Events That Bear on the Course of Business

BUSINESS trend generally is upward, according to a summary of week's forecasts, but gains are unevenly apportioned throughout the country . . . Lumber production continues less than called for by new orders . . . Crude oil output showed a gain of 18,800 barrels over the preceding week, thus maintaining flush production, despite efforts at control within the industry. Prices rule considerably lower.

RETAIL trade index, compiled by Credit Clearing House, continues below last year, standing at 111 as compared to 116 in 1929 and 100 for the year 1927.

EMPLOYMENT service of United States Department of Labor forecasts normal employment conditions within 90 days. New York has the largest proportion of jobless, with the per cent of unemployed the greatest in 15 years . . . The numbers of jobless in all of Italy is computed at about 500,000, an average number for the season.

ACCORDING to Secretary of State Stimson, the London Naval Conference has reached a definite agreement on the problem of submarine attacks on unarmed merchant vessels. He hopes that the submarine might be abolished . . . German budget for 1930-31 makes no provision for the construction of the second of six armored battleships allowed under the Versailles treaty. The first ship to be started under the treaty allowance, the famous all-welded Ersatz-Preussen, lies unfinished at Kiel.

PROSPECTS of a fair volume of construction during the spring are good, according to *Engineering News-Record* . . . Value of building contracts in January showed a decrease of only 3 per cent from December, against an expected seasonal decrease of 9 per cent . . . Department of Commerce has received specifications for air port projects for 1930, the cost of which will total \$75,000,000 . . . French national air budget for 1930 has been placed at \$120,000,000.

NEW construction in the electric light and power field to an amount of \$198,000,000 is indicated for the first quarter of the year, according to a canvass of the industry made by the National Electric Light Association. This is 10 per cent in

excess of similar expenditures for the first three months of 1929. Orders for equipment and materials in the first quarter will total \$180,000,000, also an increase for the period . . . Building permits issued in 566 representative cities and towns in January showed a loss of 46 per cent from January, 1929, as determined by S. W. Straus & Co. January showed a decline of 17 per cent from December, 1929, which in turn had declined 19 per cent from November.

ACQUISITION of Buffalo, Rochester & Pittsburgh Railroad by Baltimore & Ohio system has been agreed to by Interstate Commerce Commission—the first step in the railroad unification program, and the first link in the Baltimore & Ohio low level short line to Chicago . . . Wabash Railway Co. is in accord with the unification program.

GOODYEAR TIRE & RUBBER CO. announces 1929 net earnings of \$20,000,000. To take care of contingencies arising from the fluctuating price of rubber, over a million dollars has been added to the surplus . . . New York Central Railroad earned \$78,225,000 during 1929, exceeding the 1928 figure by over \$27,000,000 . . . Procter & Gamble Co.; Ivory soap makers, voted \$800,000 in profit sharing dividends to employees.

SIZE increases in aircraft will be most marked in sea planes, according to Lieut. Commander John Iseman, since high landing speeds required for heavy ships can best be managed on water . . . A single motored five-passenger "foolproof" plane is to be put in passenger service in Germany. Tests indicate that it cannot be put into a tail spin or backslide.

HOLDINGS of Atlantic Public Utilities Corporation, in Massachusetts and 15 other States, have been taken over by Eastern States Public Service for about \$60,000,000 . . . According to H. C. Hopson, vice-president Associated Gas & Electric Co., holding companies have been of prime importance in extending service to rural communities by raising the money necessary to build distribution systems. He said, "Probably the sole reason for this success is that holding companies have been entirely free from governmental regulation" . . . Duke Power Co. plans a 150,000-hp. steam generating plant at River Bend, N. C.

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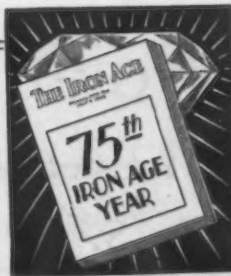
C. H. OBER
New York

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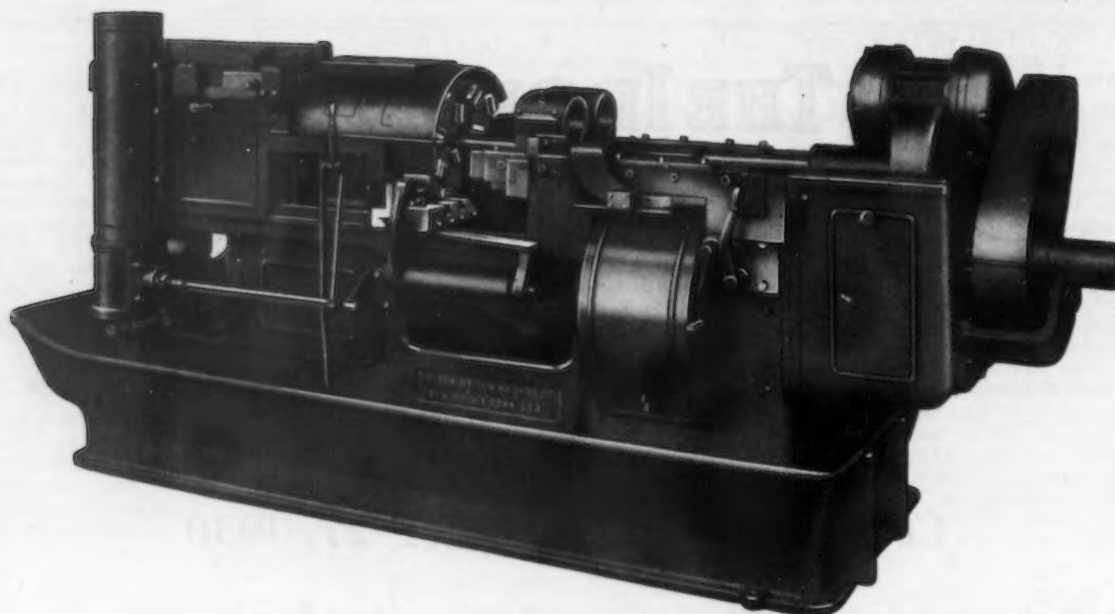
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